ORDER NO. VRD0102008C2

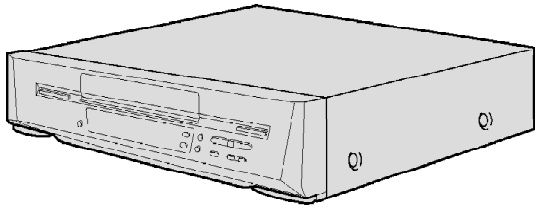
Service Manual

Video Cassette Recorder

Panasonic VHS PAL

NV-SJ220EG / NV-SJ220EGM / NV-SJ220EGN / NV-SJ220EGY / NV-SJ220B / NV-SJ220BL

Z-MECHANISM



SPECIFICATIONS

SPECIFICATIONS

ITEM	SPECIFICATION		ITEM	SPECIFICATION
POWER	SOURCE: 220-240 V AC 50/60 Hz		AUDIO	HEAD: 1 Stationary head (Normal-mono only)
	CONSUMPTION: 19 watts COMSUMPTION WHEN IN STANDBY MODE: Approx. 3W (NV-SJ220EG/EGM/EGN/EGY)			INPUT: EURO AV (AV1) Connector (21 pin) More than -6dBV (500 mV), 10 kΩ EURO AV (AV2) Connector (21 pin) More than -6dBV (500 mV), 10 kΩ (NV-SJ220B/BL)
RECORDING SYSTEM	2 rotary heads, helical scanning system			OUTPUT: EURO AV (AV1) Connector (21 pin) -6 dBV (500mV), Less than 1kΩ EURO AV (AV2) Connector (21 pin) -6 dBV (500mV), Less than 1kΩ (NV-SJ220B/BL)
	PAL		TAPE SPEED	SP: 23.39 mm/s LP: 11.695 mm/s (NV-SJ220B/BL) EP: 7.796 mm/s (NV-SJ220B/BL) Record/Playback Time: SP: 4 hours with 240 min. type tape LP: 8 hours with 240 min. type tape (NV-SJ220B/BL) EP: 12 hours with 240min type tape (NV-SJ220B/BL) FF/REW Time: 60 sec. with 180 min. type tape
TV TUNER SYSTEM	NV-SJ220EG/ EGM/EGN/EGY	VHF: CHE2-CHE12 CHA-CHH2 [ITALY] (PAL/SECAM B) UHF: CH21-CH69 (PAL/SECAM G) CATV: CHS01-CHS41 (PAL/SECAM B)	OPERATING TEMPERATURE	5°C - 40°C
	NV-SJ220B	UHF: CH21-CH68 (PAL I)	OPERATING HUMIDITY	35% - 80%
	NV-SJ220BL	VHF: CHA-CHJ (PAL I) UHF: CH21-CH69 (PAL I) CATV: 104-470MHz (PAL I)	DIMENSIONS	430 (W)×87(H)×282(D) mm
RF OUT SYSTEM	NV-SJ220EG/ EGM/EGN/EGY	UHF: CH21-CH69 (PAL/SECAM G) 71 ± 3 dBμ, 75 Ω close	WEIGHT	3.3 kg
	NV-SJ220B/BL	UHF: CH21-CH68 (PAL I) 71 ± 3 dBμ, 75 Ω close	STANDARD ACCESSORIES	1 pc. DIN-RF Cable 1 pc. AC Mains Lead 1 pc. Infra-red Remote Controller
VIDEO	HEADS: 2 rotary heads 1 pair for recording and playback (L-R heads)			
	INPUT: EURO AV (AV1) Connector (21 pin) 1.0 Vp-p, 75 Ω terminated EURO AV (AV2) Connector (21pin) 1.0Vp-p, 75 Ω terminated (NV-SJ220B/BL)			
	OUTPUT: EURO AV (AV1) Connector (21 pin) 1.0 Vp-p, 75 Ω terminated EURO AV (AV2) Connector (21pin) 1.0Vp-p, 75 Ω terminated (NV-SJ220B/BL)			

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic

1. INTRODUCTION

This service manual contains technical information which will allow service personnel to understand and service this model.
If the circuit is changed or modified, this information will be followed by supplementary service manual to be filed with original service manual.

Note:

1. **Adjustment procedures, Disassembly Procedures and Assembly Procedures for Mechanism Chassis are separate volume from this service manual. / Please refer to the service manual for Z-Mechanism Chassis. (Order No. VRD9802005C2)**
2. **The Model No. is indicated on the Schematic Diagram and Circuit Board Diagrams as follows.**

Model No.	Indication Mark
NV-SJ220EG/EGM/EGN	(A)
NV-SJ220EGY	(B)
NV-SJ220B	(C)
NV-SJ220BL	(D)

2. GENERAL DESCRIPTIONS

2.1. SERVICE CAUTION

2.1.1. REPLACING IC7702/EEPROM

When the EEPROM: IC7702 is replaced, applicable model code, option code and electrical adjustment data will not be available.
Therefore, enter and/or adjust the necessary data after replacing IC7702 by referring following procedure.

STEP1.REPLACE THE IC7702

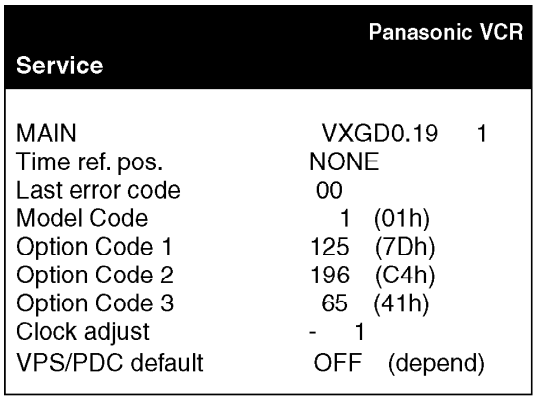
1. **Remove the C.B.A. with Mechanism unit by referring the Disassembly procedure.**
2. **Disconnect the AC plug and replace the IC7702.**

STEP2.INPUT THE MODEL & OPTION CODE

1. Set up the applicable model code and option code by ordering the following table.

PROCEDURE	F.I.P. DISPLAY
Turn on the Service Mode **1.Press the FF key and the EJECT key simultaneously for more than 3 seconds.**	
Activate the Service Mode 2 **2.While keep placing FF key, press the EJECT key in twice.**	
Activate the Entering Mode. **3.Press the EJECT key for more than 3 seconds.**	
Set the Mode 2. **4.Press the CH UP key in twice.**	
Display the Setting Code. **5.Press the POWER Button to turn the power on.**	 **(Colon starts flashing)**
Enter the Model and Option Code. **6.Set the applicable Model and Option code by using REW, PLAY, STOP and FF keys on the Remote Controller. (See Fig.S1 & S2)**	
Exit from Service Mode. **7.Press the POWER Button to turn the power off.** **8. Press FF and EJECT keys simultaneously in 6 times.**	 **(Normal Indication)**

Fig.S1 Service Secreen (sample)



Model No.	Model Code	Option Code 1	Option Code 2	Option Code 3
NV-SJ220EG/ / EGM/EGN/ EGY	17 / (11h)	9 / (09h)	212 / (D4h)	65 / (41h)
NV-SJ220B	19 / (13h)	41 / (29h)	212 / (D4h)	5 / (05h)
NV-SJ220BL	20 / (14h)	41 / (29h)	212 / (D4h)	5 / (05h)

Fig. S2 Model Code & Option Code

NOTE:
Since all electrical adjustments data is still not available, perform the Electrical Adjustment continuously.

2.1.2. CYLINDER UNIT REPLACEMENT

1. CYLINDER UNIT REPLACEMENT

A. Remove the mechanism unit from MAIN C.B.A./Chassis by referring “SECTION 2. Disassembly Procedure”.

B. Remove the 3 screws (A) of the CYLINDER UNIT with a screw driver.

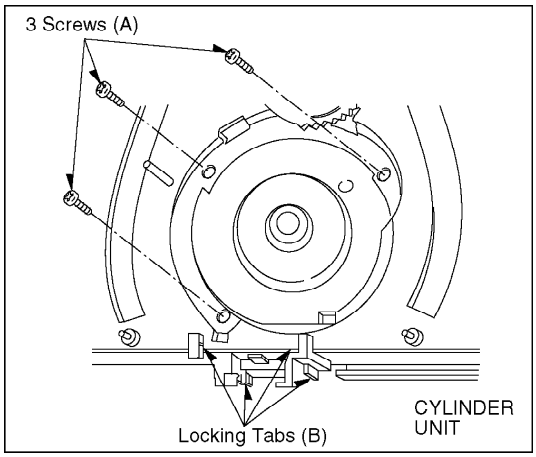
C. Unlock the 4 locking tabs (B) and disconnect the Cylinder fiexible card from the FPC Holder.

D. Remove the CYLINDER UNIT.

CAUTION:

Handle the Cylinder fiexible card with care. When it damaged, you should replace whole Cylinder unit.

Fig. S3



2. UPPER CYLINDER DISASSEMBLY

A. Remove 2 screws (A).

B. Remove the Cylinder Stator Unit.

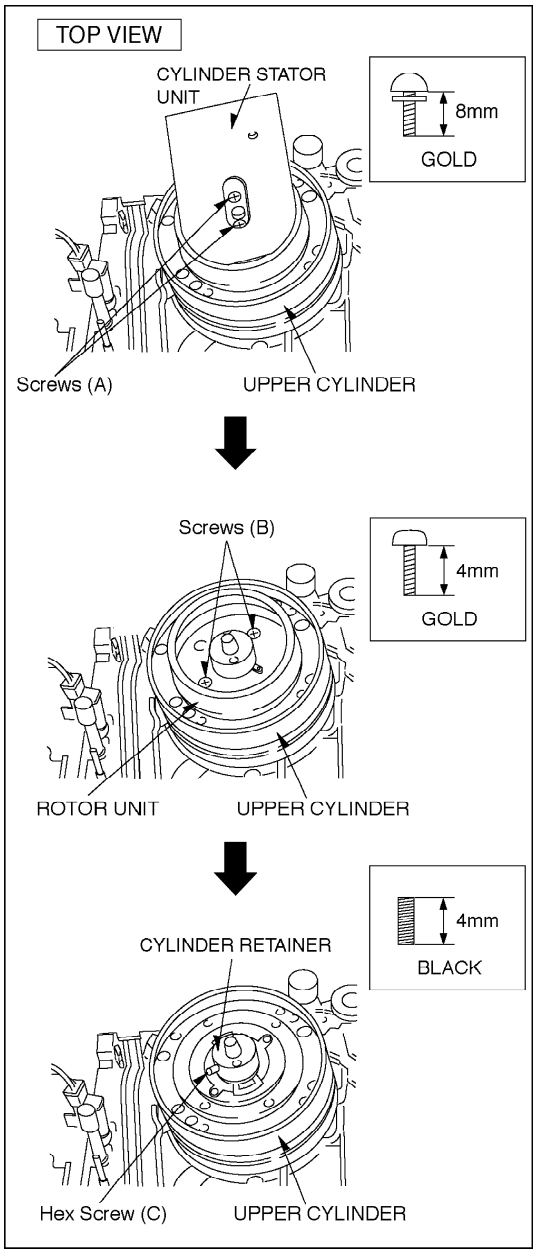
C. Remove 2 screws (B).

D. Remove the Cylinder Rotor Unit.

E. Loose Hex screw (C) (1.5 mm) and remove the CYLINDER RETAINER.

F. Remove the Upper Cylinder.

Fig. S4



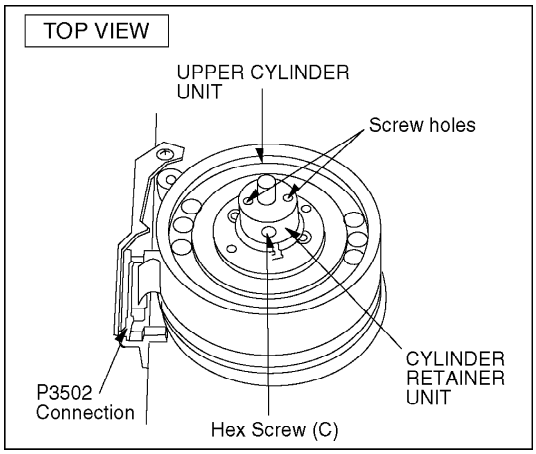
3. UPPER CYLINDER ASSEMBLY

When reassembling, perform the steps in the reverse order.

Notes:

1. **Install the Cylinder Retainer so that the 2 holes on top of the Cylinder Retainer are at right angles with the P3502 Connection.**
2. **Tighten the Hex screw (C) (1.5 mm) while pressing down on top of the Cylinder Retainer.**

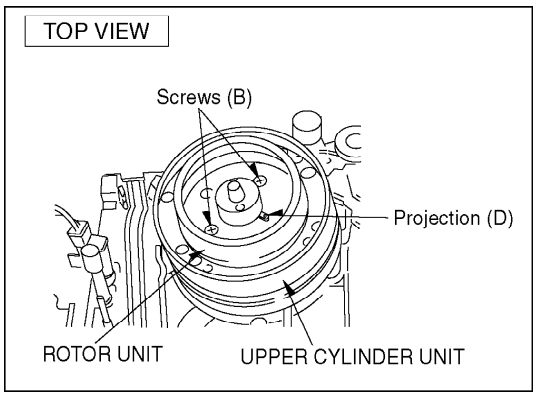
Fig. S5



3. Install the Cylinder Rotor Unit so that the inner hole of the Cylinder Rotor Unit fits to the small projection (D) on top of the Upper Cylinder.

4. Tighten 2 screws (B).

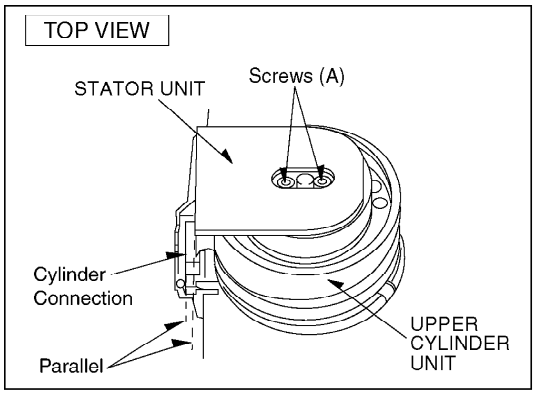
Fig. S6



5. install the Cylinder Stator Unit.

6. Tighten 2 screws (A).

Fig. S7



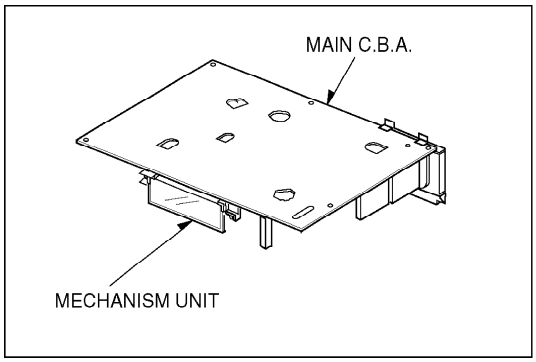
7. Confirm the PG SHIFTER ADJUSTMENT with the alignment tape

(PAL: VFJ8125H3F) and adjust it if necessary.

2.1.3. CHECKING OF MAIN C.B.A.

When servicing the MAIN C.B.A., take out the MAIN C.B.A. and mechanism from the frame and turn over.

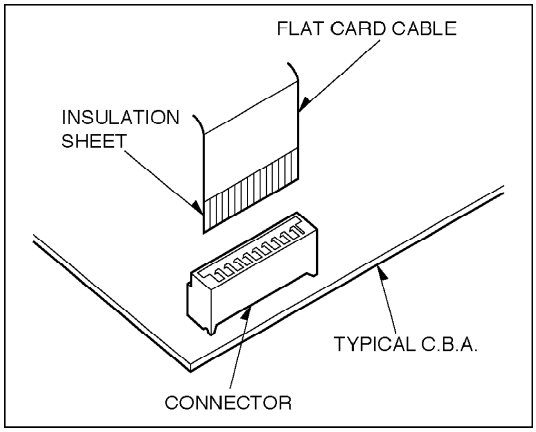
Fig. S8



2.1.4. FLAT CARD CABLE INSTALLATION

When installing the Flat Card Cable on the connector, install the Flat Card Cable with the cable contacts facing the connector contacts.

Fig. S9



2.2. REMOVAL OF CASSETTE TAPE

There are 2 ways to remove a cassette tape.

1. Service Information Display Operation

A. Press the FF and EJECT keys simultaneosly for 3 seconds and set the Service Mode 7.

B. Press STOP key in order to rotate the Loading Motor for unloading operation. (Pay an attention of tape slack)

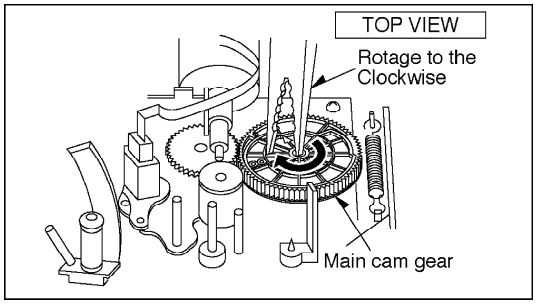
2. Manual Operation

A. Disconnect the AC Mains Lead and remove the Top Panel.

B. Rotate the Main Cam Gear clockwise until the Loading Posts

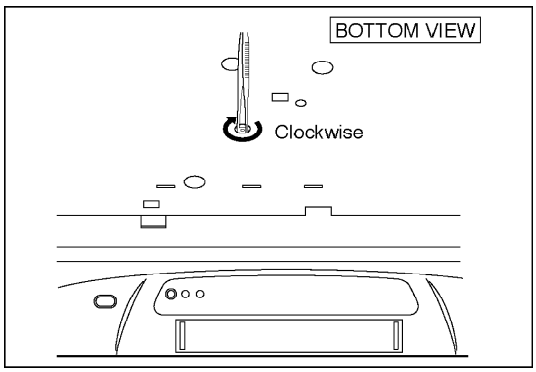
move to fully unloaded position as shown in Fig.S10. (Tape is remaining)

Fig. S10



C. Rotate the Capstan Motor clockwise from the bottom side to take up the tape.

Fig. S11



D. Rotate the Main Cam Gear clockwise until the cassette tape is ejected.

2.3. INTRODUCTION OF VIDEO HEAD CLEANING CASSETTE / (POLISHING TYPE)

1. **We are pleased to introduce Panasonic Video Head Cleaning Cassette, VFK0923FT [for service purposes] and VFK0923FSE [for end users] for all VHS/SVHS VCP and VCR.**
2. **These cleaning cassettes are exclusive removing the hard and sticky clogging on video heads.**
3. **These improve the efficiency of video head cleaning service and shortening cleaning time for end users.**

VFK0923FT (For Service usage)	
Type of Cassette	**Full VHS Cassette**
Cleaning Time	**10 Seconds/Time**
Tape Length	**20 m**
Usability in a Path	**180 Times**

VFK0823FSE (For end users)	
Type of Cassette	**Full VHS Cassette**
Cleaning Time	**10 Seconds/Time**
Tape Length	**3.34 m**
Usability in a Path	**30 Times**

VFK0823FSE (For end users)

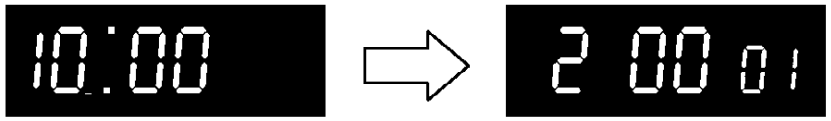
Note:

The tape material itself is the same in both types.

2.4. SELF-DIAGNOSIS RESULT DISPLAY

The "SELF-DIAGNOSIS RESULT DISPLAY & MEMORY function is built in this VTR.
It means that when the VCR detects undesirable condition, it can be displayed a “Error code (Two numbers from the left)” with Service Mode 2.
Since the "Error code" is stored in the EEPROM, it can be displayed although after disconnected the AC leads. It can be displayed with Service Mode 2.
(If a second error had been detected, only the most recent error is displayed.)
For more details, refer to the Service Manual for Z-Mechanism Chassis Order number VRD9612M129.

Displaying an Example



[Normal Indication]

[Error Code “01”]
(Service Mode 2)

INDICATION	CAUSE	REMEDY/CHECK
01	After cylinder lock is detected, the cylinder does not start rotating again even after tape unloading.	Check the cylinder motor drive circu
02	Cassette tape is not wound up during the tape unloading except EJECT mode.	Check the capstan motor drive circu
03	Mechanism locks during mode transition except EJECT mode.	1. Check the loading motor drive circuit. 2. Check the mechanism phase alignment. 3. Check the mode switch.
04	Mechanism locks during tape unloading.	1. Check the loading motor drive circuit. 2. Check the mechanism phase alignment.
06	Mechanism locks after tape unloading in EJECT mode.	1. Check the loading motor drive circuit. 2. Check the mechanism phase alignment for cass
07	During recording mode, recording signal is less than the normal condition.	Protection of the over-current flowin transistor which produces the powe for recording mode.
08	Recording circuit works except recording mode.	Check the recording circuit.
16	Cylinder lock detection.	Check the cylinder unit and the cylir drive circuit.
17	Supply reel mechanism lock detection	Check the supply reel mechanism ai supply reel circuit.
18	Take-up reel mechanism lock detection	Check the Take-up reel mechanism a Take-up reel circuit.
2*	PG shifter automatic adjustment error.	Check the servo/system control circ cylinder unit.

Fig. T1 Self-Test indication Display

2.5. CAUTION FOR AC MAINS LEAD (NV-SJ220B/BL)

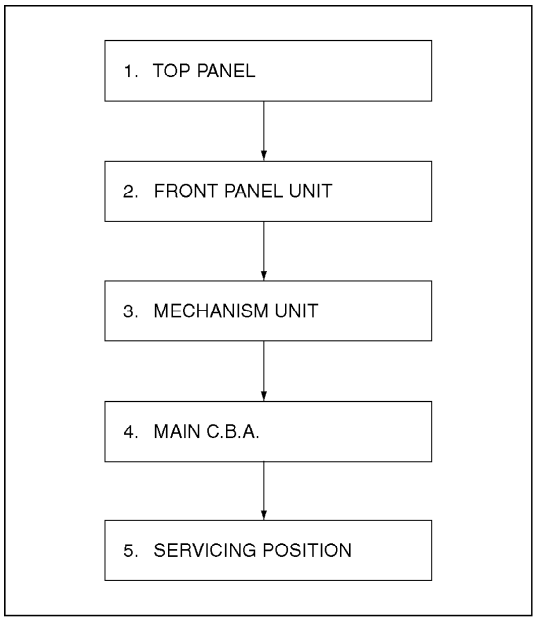
3. ADJUSTMENT PROCEDURES

3.1. DISASSEMBLY METHOD

3.1.1. DISASSEMBLY FLOW CHART

This flow chart indicates disassembly steps of the cabinet parts and the circuit boards in order to find the necessary items for servicing.
When reassembling, perform the steps in the reverse order.

Fig. D1

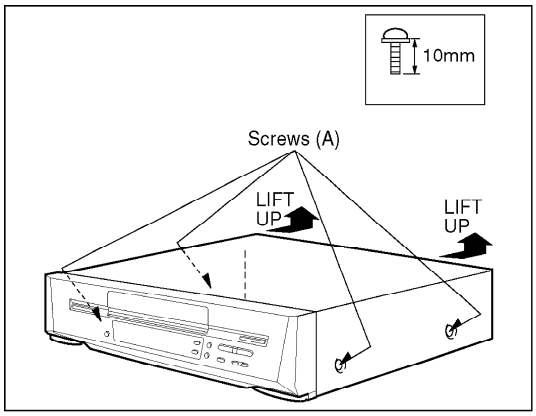


3.1.2. DETAIL OF DISASSEMBLY METHOD

1. REMOVAL OF THE TOP PANEL

Remove	**4 Screws (A)**

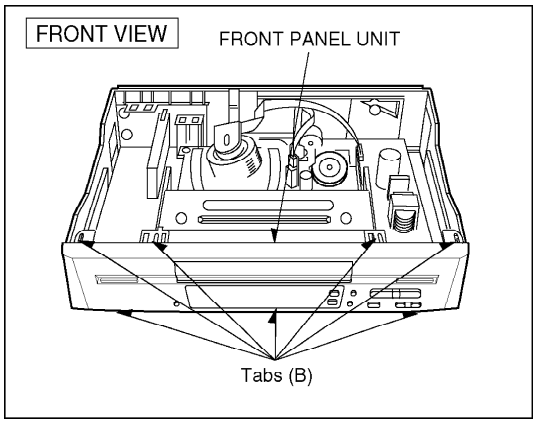
Fig.D2



2. REMOVAL OF THE FRONT PANEL UNIT

Unlock	**7 Tabs (B)**

Fig. D3



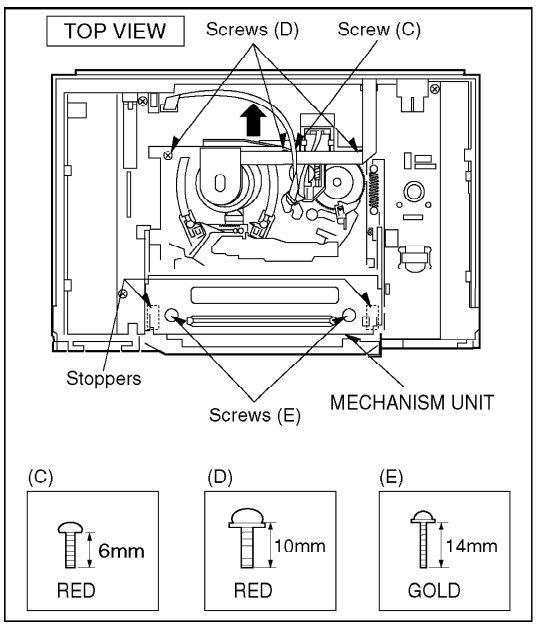
3. REMOVAL OF THE MECHANISM UNIT

Remove	**Screw (C)**
Remove	**3 Screws (D)**
Remove	**2 screw (E)**

Note:

1. **Keep pressing 2 stoppers on Cassette Holder Plate and Press Cassette Holder Plate to the rear.**
2. **Remove the Mechanism Unit after bend the Cylinder Shield in the direction of the arrow.**

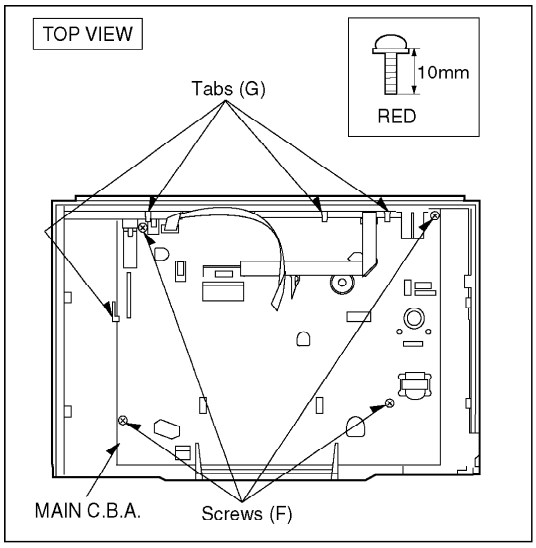
Fig. D4



4. REMOVAL OF THE MAIN C.B.A.

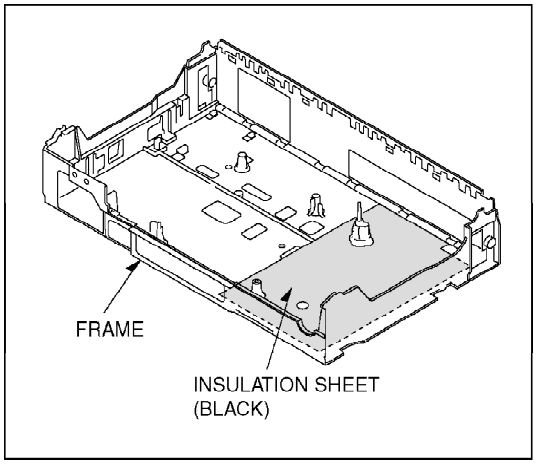
Remove	**4 screws (F)**
Unlock	**4 Tabs (G)**

Fig. D5



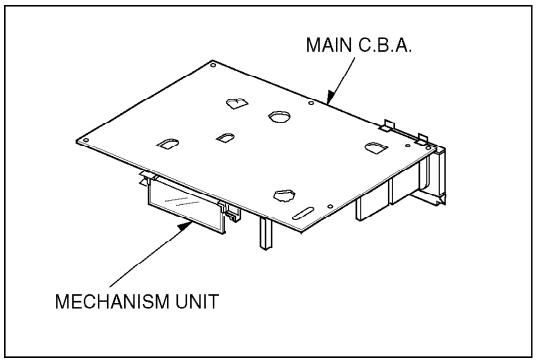
NOTE:
Before mounting the MAIN C.B.A. onto the frame, be sure to confirm that the insulation sheet is mounted on the frame as shown in Fig. D6.

Fig. D6



5. SERVICING POSITION

Fig. D7



3.2. MECHANICAL ADJUSTMENT PROCEDURES

Refer to the Service Manual for Z-Mechanism Chassis. / (Order No. VRD9802005C2)

3.3. ELECTRICAL ADJUSTMENT PROCEDURES

3.3.1. TEST EQUIPMENT

The following equipments are required for Electrical Adjustments.

1. Dual-Trace Oscilloscope
   - Voltage Range: 0.005-5V/div
   - Frequency Range: DC-35MHz
   - Probes: 10:1 / 1:1
2. Frequency Counter
   - Frequency Range: 0-10MHz
   - Probes: 1:1
3. Universal Counter
4. Digital Volt Meter (D.V.M.)
5. Video Sweep Generator
6. Sinewave Generator
7. Video Pattern Generator
8. Monitor TV
9. DC Power Supply
10. VHS Blank Tape
11. VHS Alignment Tape
    - Parts No.: VFJ8125H3F(PAL)

3.3.2. VCR SETTING

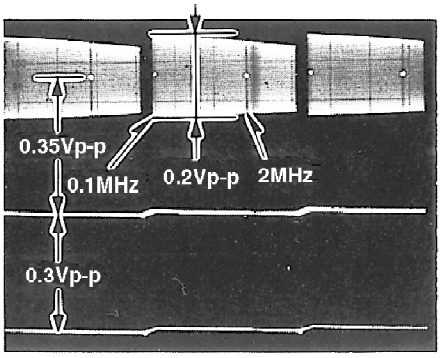
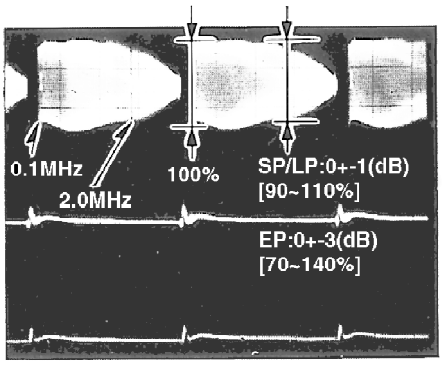
When no indication in the procedure, set each selector as follows.

1. TAPE SPEED: SP

2. CHANNEL: AV1/AV2
(Set to signal input terminal number)

3.3.3. ADJUSTMENTS

ITEM	TP	ADJ.	MODE	INPUT	TAPE	M. EQ.	SPEC.	REMAR
PG SHIFTER / ADJUSTMENT	---	---	PLAYBACK	---	ALIGNMENT TAPE / (PAL)	---	---	Refer to proced PG SHIFTER ADJUSTMENT in Fig.E3.
AI FUNCTION / ADJUSTMENT	---	---	PLAYBACK / (SELF-REC)	PAL / COLOUR / BAR	BLANK / TAPE	---	---	Refer to the pro of AI FUNCTIO ADJUSTMENT in Fig.E4.
VIDEO / FREQUENCY / RESPONSE / ADJUSTMENT	VIDEO OUT	---	SP/LP/EP / PLAYBACK / (SELF-REC)	VIDEO / SWEEP / (See Fig.E1)	BLANK TAPE	OSCILLO / SCOPE / / VIDEO SWEEP GENERATOR	SP: 0+-1 (dB) (90~110%) LP: 0+-1 (dB) (90~110%) EP: 0+-3 (dB) (70~140%) [LP/EP MODE: B/BL ONLY] (SeeFig. E2)	Refer to the pro of VIDEO FREQ RESPONSE ADJUSTMENT in Fig. E5.

Fig.E1	Fig.E2	
		
CONDITION: BURST SIGNAL OFF / 75 ohm TERMINATED		

3.3.4. PG SHIFTER ADJUSTMENT / (AUTOMATIC)

PROCEDURES	FIP DISPLAY
Press the FF and EJECT Keys simultaneously for 3 seconds.	
Press the FF and EJECT Keys simultaneously twice.	
Press the EJECT key for 3 seconds.	
Press the CH UP key once.	
Insert the Alignment cassette tape. (PAL:VFJ8125H3F)	
When the sequence of the automatical adjustment has been terminated, the following action has been made. *SUCCEED: The cassette tape is ejected. *ERROR : The "F2"is displayed on the FIP. (Check the Servo/Syscon circuit and Cylinder unit.)	
Release the Service mode by pressing the EJECT and FF keys simultaneously in 6 times until the FIP becomes normal indication.	

Fig. E3

3.3.5. AI FUNCTION ADJUSTMENT (AUTOMATIC)

PROCEDURES	FIP DISPLAY
Press the FF and EJECT Keys simultaneously for 3 seconds.	
Press the FF and EJECT Keys simultaneously twice.	
Press the EJECT key for 3 seconds.	
Press the CH UP key in 3 times.	
Insert the blank cassette tape. (The adjustment is automatically started.)	
When the sequence of the automatical adjustment has been terminated successfully, the VCR goes to STOP mode.	
Release the Service mode by pressing the EJECT and FF keys simultaneously in 6 times until the FIP becomes normal indication.	

Fig. E4

3.3.6. VIDEO FREQUENCY RESPONSE ADJUSTMENT

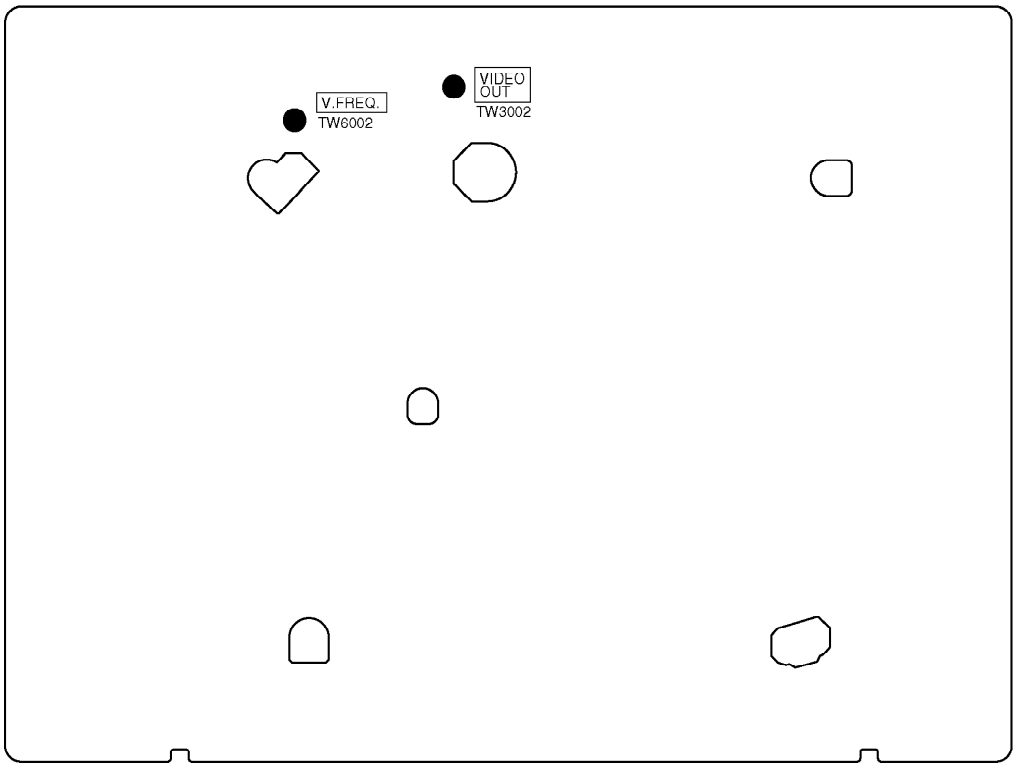
PROCEDURES	FIP DISPLAY
Input the Video sweep signal. (See Fig.E1)	
Press the FF and EJECT Keys simultaneously for 3 seconds.	
Press the FF and EJECT Keys simultaneously twice.	
Press the EJECT key for 3 seconds.	
Press the CH UP and/or CH DOWN key until "11" is displayed on FIP.	
Insert the Self-recorded tape and playback it. (SP/LP/EP mode)	

PROCEDURES	FIP DISPLAY
Connect the Oscilloscope to: ***CH1....Video Out (TW3002).** ***CH2....V.FREQ.(TW6002)**	
Press the "4" key on the remote controller. **(Confirm that TW6002 becomes high(5V)).**	
Adjust the Frequency response by pressing the "2"(increase) and/or "8"(decrease) key on the Remote Controller. (See Fig.E2)	
Store the Adjusted value by pressing the "5" key on the Remote Controller.	
Release the Service mode by pressing the EJECT and FF keys simultaneously in 6 times until the FIP becomes normal indication.	

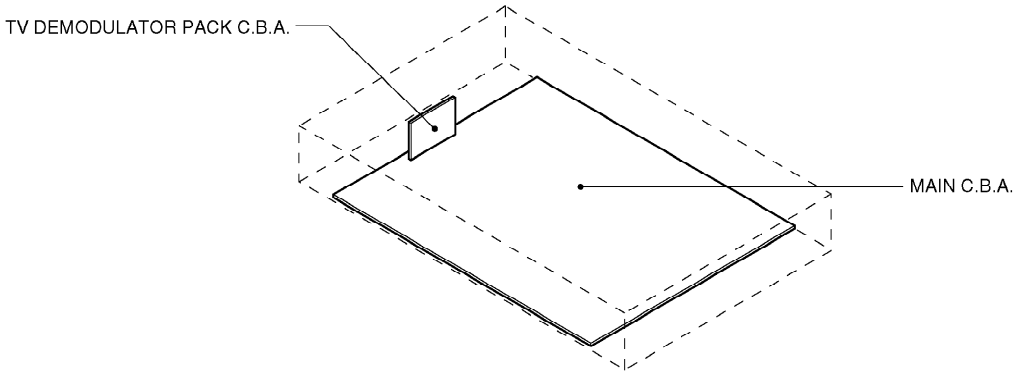
Fig. E5

3.3.7. LOCATION OF TEST POINTS & CONTROLS

MAIN C.B.A.



3.3.8. CIRCUIT BOARD LAYOUT



4. ABBREVIATIONS

5. INPUT/OUTPUT CHART

5.1. INPUT/OUTPUT CHART FOR IC6001

Fig. MP1

Fig. MP2

Fig. MP3

Fig. MP4

5.2. TRUTH TABLE (EG/EGM/EGN/EGY MODEL)

5.3. TRUTH TABLE (B/BL MODEL)

6. WAVEFORM TABLE & VOLTAGE CHART

6.1. WAVEFORM TABLE

6.2. VOLTAGE CHART

7. BLOCK DIAGRAMS

7.1. SYSTEM CONTROL & SERVO BLOCK DIAGRAM

7.2. LUMINANCE & CHROMINANCE BLOCK DIAGRAM

8. SCHEMATIC DIAGRAMS

8.1. POWER TRANSFORMER SECTION IN MAIN SCHEMATIC DIAGRAM

8.2. POWER SUPPLY/ RF SECTION IN MAIN SCHEMATIC DIAGRAM

8.3. TIMER SECTION IN MAIN SCHEMATIC DIAGRAM

8.4. SYSTEM CONTROL & SERVO SECTION IN MAIN SCHEMATIC

DAIGRAM

8.5. LUMINANCE & CHROMINANCE/ AUDIO SECTION IN MAIN SCHEMATIC DIAGRAM

8.6. INPUT/ OUTPUT SECTION IN MAIN SCHEMATIC DIAGRAM

8.7. TV DEMODULATOR PACK SCHEMATIC DIAGRAM

8.8. CYLINDER STATOR UNIT SCHEMATIC DIAGRAM

8.9. CAPSTAN UNIT SCHEMATIC DIAGRAM

9. CIRCUIT BOARD ASSEMBLIES

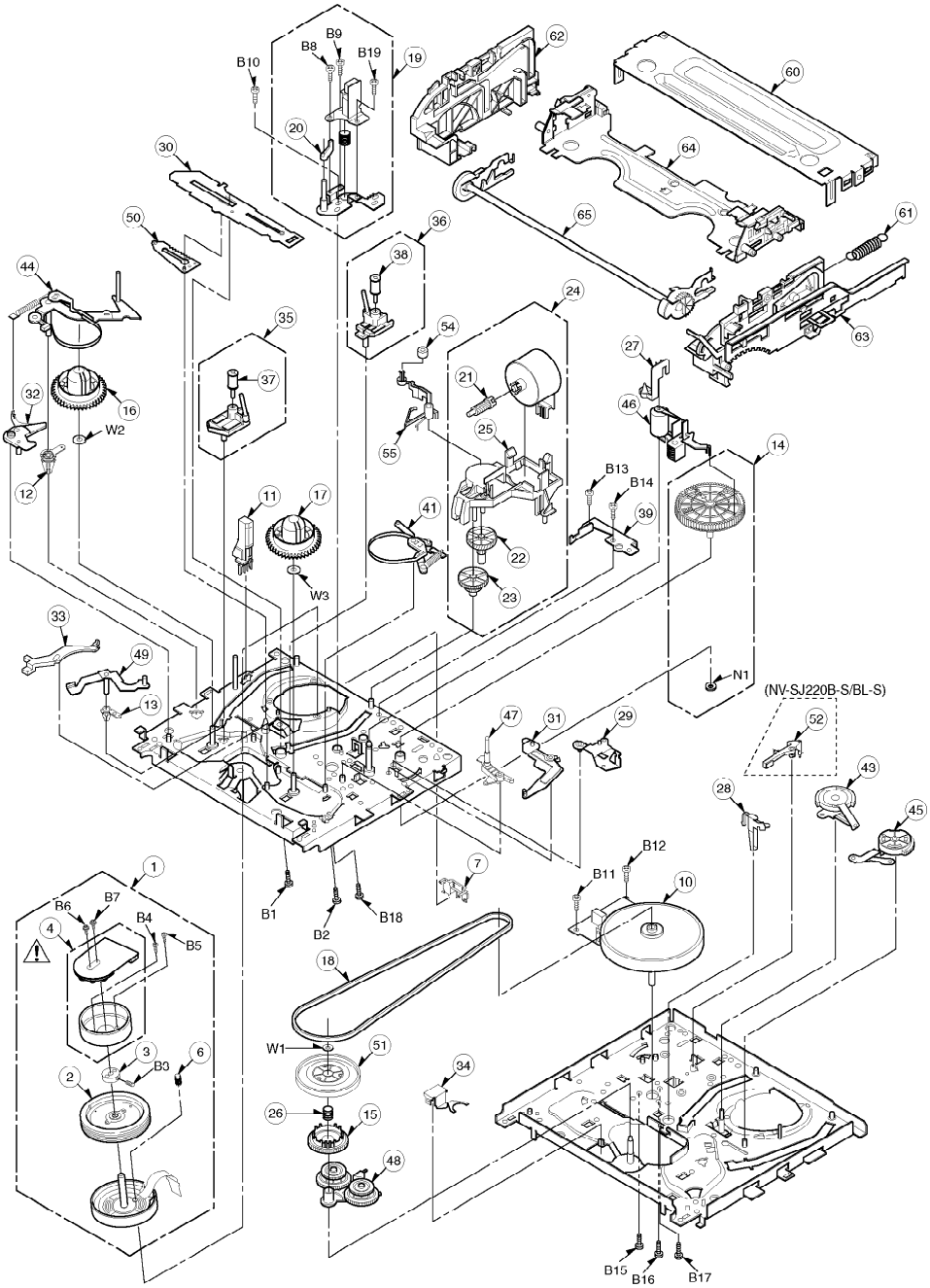
9.1. MAIN C.B.A.

9.2. CYLINDER STATOR UNIT

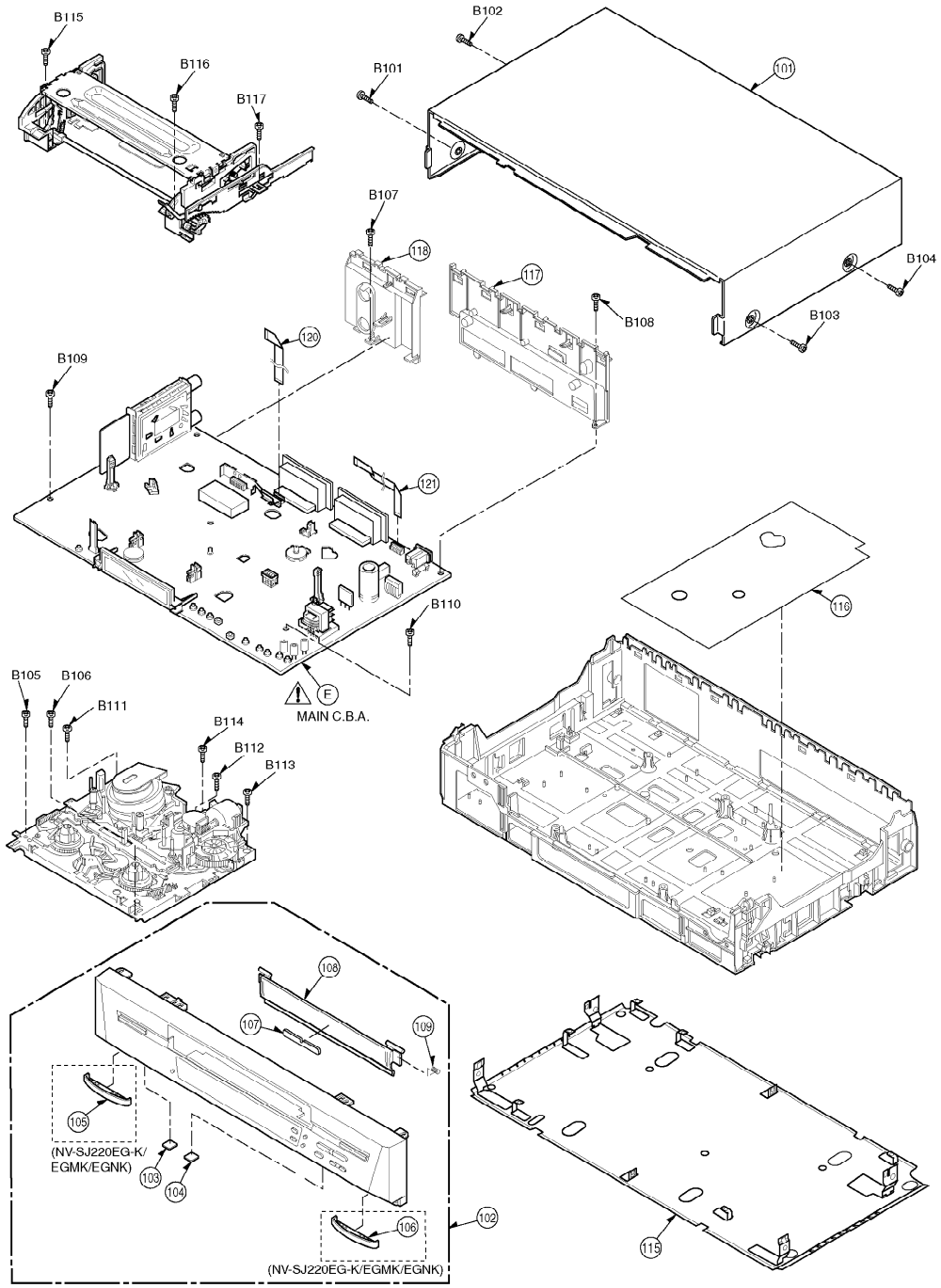
9.3. TV DEMODULATOR PACK C.B.A.

10. EXPLODED VIEWS

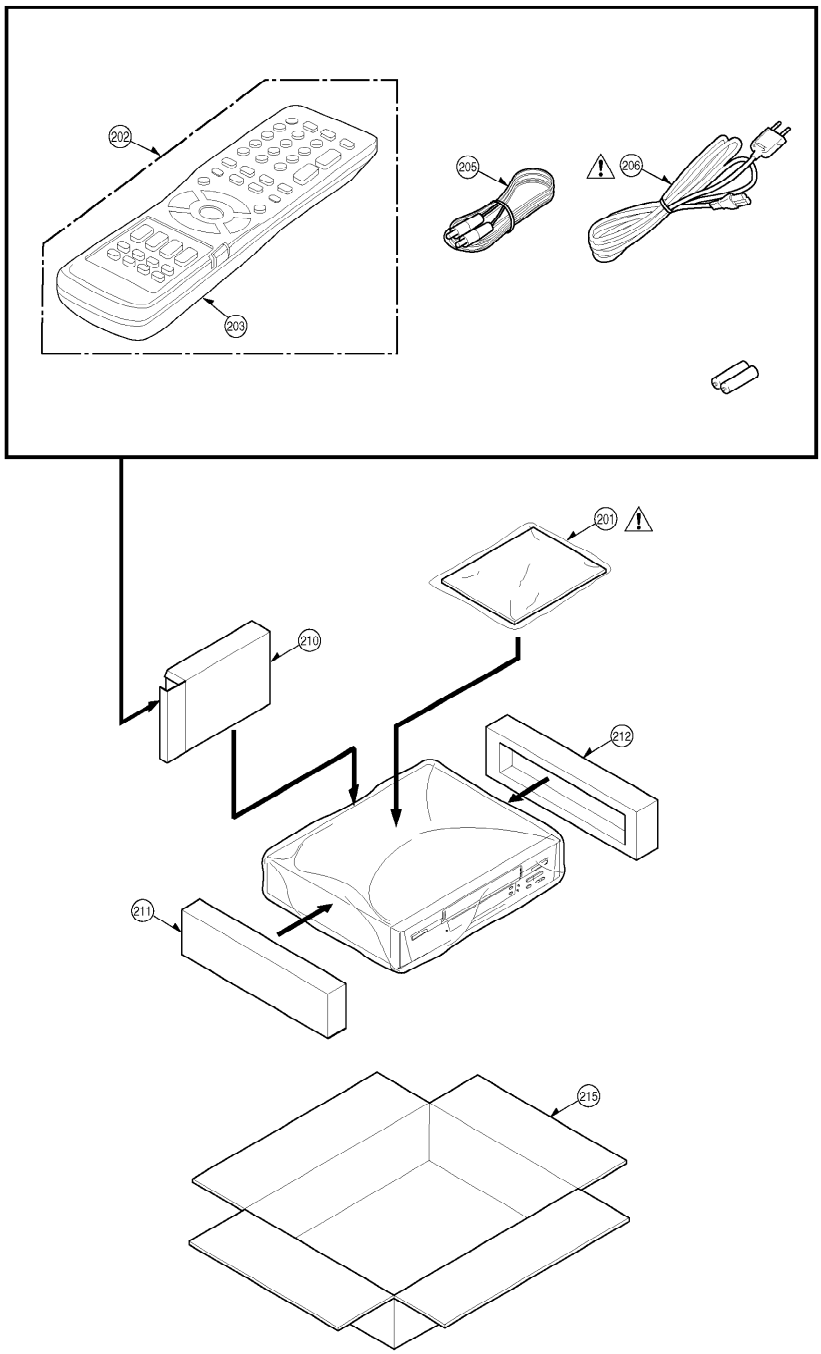
10.1. CHASSIS PARTS SECTION



10.2. CASING PARTS SECTION



10.3. PACKING PARTS SECTION



11. REPLACEMENT PARTS LIST

11.1. CHASSIS PARTS SECTION PARTS LIST

Ref. No.	Part No.	Part Name & Description	Remarks
1	VEG1562	CYLINDER UNIT	[SUPPLIED FROM MBV]NV-SJ220EG-S/EG-K/EGNK/EGMK/EGYS
	VEG1563	CYLINDER UNIT	[SUPPLIED FROM MBV]NV-SJ220B-S/BL-S
2	VXP2083	UPPER CYLINDER UNIT	[SUPPLIED FROM MBV]NV-SJ220EG-S/EG-K/EGNK/EGMK/EGYS
	VXP2084	UPPER CYLINDER UNIT	[SUPPLIED FROM MBV]NV-SJ220B-S/BL-S
3	VDB1256	CYLINDER RETAINER	
4	VEM0715	CYLINDER MOTOR UNIT	
6	VXS0135	EARTH BRUSH UNIT	
7	VMD3796	FLAT CABLE HOLDER	[SUPPLIED FROM MBV]
10	VEK9069	CAPSTAN UNIT	
11	L1AZ00000004	FE HEAD	
12	VDB1431	TENSION ARM BOSS	
13	VDB1460	SUPPLY BRAKE ARM BOSS	
14	VDG1220KIT	MAIN CAM GEAR	
15	VDG1221	CONVERSION GEAR	
16	VDR0350	REEL TABLE	
17	VDR0350	REEL TABLE	
18	VDV0382	CAPSTAN BELT	
19	VED0412	A/C HEAD UNIT	
20	VMX2656	P4 CAP	
21	VDG1217	WORM GEAR	
22	VDG1218	WORM WHEEL GEAR	
23	VDG1219	CENTRE GEAR	
24	VEM0604	LOADING MOTOR UNIT	
25	VMD2619	MOTOR BRACKET	
26	VMB3045	CONVERSION GEAR SPRING	
27	VMD2620	OPENER PIECE	
28	VMD2738	LED PRISM	
29	VML3165	DRIVE RACK ARM	
30	VML3166	MAIN LEVER	
31	VML3167	DRIVE MAIN LEVER ARM	
32	VML3172	SUPPLY SPRING ARM	
33	VML3176	CONVERSION LEVER A	
34	VML3177	CONVERSION LEVER B	
35	VXA6040	INCLINED BASE (S) UNIT	
36	VXA5854	INCLINED BASE (T) UNIT	
37	VXP1891	ROLLER POST	
38	VXP1891	ROLLER POST	
39	VMA9672	SUPPORT ANGLE	
41	VXL2667	TAKE UP BRAKE ARM UNIT	
43	VXL2670	TAKE UP LOADING ARM UNIT	
44	VXL2793	TENSION ARM UNIT	
45	VXL2672	SUPPLY LOADING ARM UNIT	
46	VXL2785	PINCH ARM UNIT	
47	VXL2996	P5 ARM UNIT	
48	VXL2792	IDLER ARM UNIT	
49	VXL2733	SUPPLY BRAKE ARM UNIT	
50	VXL2747	LOADING RACK UNIT	
51	VXP2035	CENTRE CLUTCH UNIT	
52	VXZ0430	SS BRAKE ARM UNIT	NV-SJ220B-S/BL-S
54	VDP1668-K	CLEANER ROLLER	
55	VML3164	CLEANER ARM	

Ref. No.	Part No.	Part Name & Description	Remarks
60	VMA9516	TOP PLATE	
61	VMB3047	CONNECTION SPRING	
62	VMD3379	SIDE PLATE (L)	
63	VXA6540	SIDE PLATE (R) UNIT	
64	VXA5746	CASSETTE HOLDER UNIT	
65	VXP1730	MAIN SHAFT UNIT	
B1	VHD1117	SCREW	
B2	VHD1117	SCREW	
B3	VHD0842	SCREW	
B4	VHD0843	SCREW	
B5	VHD0843	SCREW	
B6	VHD0844	SCREW	
B7	VHD0844	SCREW	
B8	VHD1066	SCREW	
B9	VHD1066	SCREW	
B10	VHD1044	SCREW	
B11	VHD1060	SCREW	
B12	VHD1071	SCREW	
B13	XTS26+6F	SCREW	
B14	XTN26+6F	SCREW	
B15	XTN26+7J	SCREW	
B16	XTN26+7J	SCREW	
B17	XTN26+7J	SCREW	
B18	VHD1095	SCREW	
B19	VHD1185	SCREW	
N1	VHN0311	PUSH NUT	
W1	VMX2208	WASHER	
W2	VMX3022	WASHER	
W3	VMX3022	WASHER	

11.2. CASING PARTS SECTION PARTS LIST

Ref. No.	Part No.	Part Name & Description	Remarks
101	VGM1733	TOP PANEL	NV-SJ220EG-S/EGYS/B-S/BL-S
	VGM1748	TOP PANEL	NV-SJ220EG-K/EGNK/EGMK
102	VYP8017	FRONT PANEL UNIT	[SUPPLIED FROM MBV]NV-SJ220EG-S/EGYS
	VYP8094	FRONT PANEL UNIT	[SUPPLIED FROM MBV]NV-SJ220EG-K/EGNK/EGMK
	VYP8018	FRONT PANEL UNIT	[SUPPLIED FROM MBV]NV-SJ220B-S/BL-S
103	RKA0072-K	FOOT	
104	RKA0072-K	FOOT	
105	VKA0191	LEG	NV-SJ220EG-K/EGNK/EGMK
106	VKA0191	LEG	NV-SJ220EG-K/EGNK/EGMK
107	VGB0554	SUPER DRIVE BADGE	[SUPPLIED FROM MBV]
108	VKF3322	BLINDER PANEL	[SUPPLIED FROM MBV]NV-SJ220EG-S/EGYS/B-S/BL-S
	VKF3323	BLINDER PANEL	[SUPPLIED FROM MBV]NV-SJ220EG-K/EGNK/EGMK
109	VMB2521	BLINDER SPRING	
115	VKU0575	BOTTOM PLATE	[SUPPLIED FROM MBV]
116	VMZ3099	VO SHEET	[SUPPLIED FROM MBV]
117	VJH1176	AV JACK PLATE	[SUPPLIED FROM MBV]NV-SJ220EG-S/EG-K/EGNK/EGMK/EGYS
	VJH1175	AV JACK PLATE	[SUPPLIED FROM MBV]NV-SJ220B-S/BL-S
118	VJH1174	ANT JACK PLATE	[SUPPLIED FROM MBV]
120	VWJ1461	FLAT CARD CABLE (6P)	[SUPPLIED FROM MBV]P4003-A/C HEAD
121	VWJ1282	FLAT CARD CABLE (9P)	[SUPPLIED FROM MBV]P2502-P2901
B101	XTW3+10TFC	SCREW	NV-SJ220EG-S/EGYS/B-S/BL-S
	XTW3+10TFZ	SCREW	NV-SJ220EG-K/EGNK/EGMK
B102	XTW3+10TFC	SCREW	NV-SJ220EG-S/EGYS/B-S/BL-S
	XTW3+10TFZ	SCREW	NV-SJ220EG-K/EGNK/EGMK
B103	XTW3+10TFC	SCREW	NV-SJ220EG-S/EGYS/B-S/BL-S
	XTW3+10TFZ	SCREW	NV-SJ220EG-K/EGNK/EGMK
B104	XTW3+10TFC	SCREW	NV-SJ220EG-S/EGYS/B-S/BL-S
	XTW3+10TFZ	SCREW	NV-SJ220EG-K/EGNK/EGMK
B105	VHD0168	SCREW	
B106	VHD0168	SCREW	
B107	VHD1092	SCREW	
B108	VHD1092	SCREW	
B109	VHD1092	SCREW	
B110	VHD1092	SCREW	
B111	VHD1092	SCREW	
B112	VHD1092	SCREW	
B113	VHD1092	SCREW	
B114	XTV26+6JFR	SCREW	
B115	XTV26+8FR	SCREW	
B116	XTV26+8FR	SCREW	
B117	XTV26+8FR	SCREW	

11.3. PACKING PARTS SECTION PARTS LIST

Ref. No.	Part No.	Part Name & Description	Remarks
201	VQT9015	OPERATING INSTRUCTIONS(GERMAN)	⚠ [SUPPLIED FROM MBV]NV-SJ220EG-S/EG-K/EGMK/EGYS
	VQT9016	OPERATING INSTRUCTIONS(FRENCH)	⚠ [SUPPLIED FROM MBV]NV-SJ220EG-S/EGMK/EGYS
	VQT9017	OPERATING INSTRUCTIONS(ITALIAN)	⚠ [SUPPLIED FROM MBV]NV-SJ220EG-S/EGYS
	VQT9018	OPERATING INSTRUCTIONS(SPANISH)	⚠ [SUPPLIED FROM MBV]NV-SJ220EG-S
	VQT9019	OPERATING INSTRUCTIONS(DUTCH)	⚠ [SUPPLIED FROM MBV]NV-SJ220EG-S/EG-K/EGMK
	VQT9020	OPERATING INSTRUCTIONS(SWEDISH)	⚠ [SUPPLIED FROM MBV]NV-SJ220EG-S/EGNK/EGYK
	VQT9022	OPERATING INSTRUCTIONS(FINNISH)	⚠ [SUPPLIED FROM MBV]NV-SJ220EG-S
	VQT9023	OPERATING INSTRUCTIONS(PORTUGUESE)	⚠ [SUPPLIED FROM MBV]NV-SJ220EG-S
	VQT9024	OPERATING INSTRUCTIONS(GREEK)	⚠ [SUPPLIED FROM MBV]NV-SJ220EG-S
	VQT9021	OPERATING INSTRUCTIONS(DANISH)	⚠ [SUPPLIED FROM MBV]NV-SJ220EGNK
	VQT9014	OPERATING INSTRUCTIONS(ENGLISH)	⚠ [SUPPLIED FROM MBV]NV-SJ220EGYS/EGNK
	VQT9047	OPERATING INSTRUCTIONS(ENGLISH)	⚠ [SUPPLIED FROM MBV]NV-SJ220B-S/BL-S
202	N2QAKB000001	REMOTE CONTROLLER	[SUPPLIED FROM MBV]
203	R0186-720010	BATTERY COVER	[SUPPLIED FROM MBV]
205	VJA1089	DIN RF CABLE	K1TWACC00001
206	VJA1023	AC CORD	⚠ [SUPPLIED FROM MBV]NV-SJ220EG-S/EG-K/EGNK/EGMK/EGYS
	VJA1022	AC CORD	⚠ [SUPPLIED FROM MBV]NV-SJ220B-S/BL-S
210	VPK2246	ACCESSORIES PACKING	[SUPPLIED FROM MBV]
211	VPN5491	CUSHION (L)	[SUPPLIED FROM MBV]
212	VPN5492	CUSHION (R)	[SUPPLIED FROM MBV]
215	VPG0H46	PACKING	[SUPPLIED FROM MBV]NV-SJ220EG-S/B-S/BL-S/EGYS
	VPG0H45	PACKING	[SUPPLIED FROM MBV]NV-SJ220EG-K/EGNK/EGMK
		SERVICE FIXTURES & TOOLS	
	VFJ8125H3F	VHS ALIGNMENT TAPE (PAL)	
	VFK0335	RETAINING RING REMOVER (3mm/4mm)	
	VFK0329	POST ADJUSTMENT SCREWDRIVER	
	VFK0326	HEX WRENCH SET	
	VFK0132	BACK TENSION METER	
	VFK27	HEAD CLEANING STICK	
	VFK1024	MOLYTONE GREASE	
	VFK0330	FINE ADJUSTMENT GEAR DRIVER	
	VFK1301	SILICONE GREASE	

11.4. ELECTRICAL PARTS LIST

Ref. No.	Part No.	Part Name & Description	Remarks
■	VEP06D85S	MAIN C.B.A.	(RTL)[SUPPLIED FROM MBV]NV-SJ220B-S
			THE FOLLOWING C.B.A. IS INCLUDED IN MAIN C.B.A.
			VEP07A23P
■	VEP06D85T	MAIN C.B.A.	(RTL)[SUPPLIED FROM MBV]NV-SJ220BL-S
			THE FOLLOWING C.B.A. IS INCLUDED IN MAIN C.B.A.
			VEP07A23P
■	VEP06D85R	MAIN C.B.A.	(RTL)[SUPPLIED FROM MBV]NV-SJ220EG-K/EG-S/EGNK/EGMK
			THE FOLLOWING C.B.A. IS INCLUDED IN MAIN C.B.A.
			VEP07A23N
■	VEP06E00L	MAIN C.B.A.	(RTL)[SUPPLIED FROM MBV]NV-SJ220EGYS
			THE FOLLOWING C.B.A. IS INCLUDED IN MAIN C.B.A.
			VEP07A23N
■	VEP07A23P	TV DEMODULATOR PACK C.B.A	(RTL)[SUPPLIED FROM MBV]NV-SJ220B-S/BL-S
			INCLUDED IN MAIN C.B.A.(VEP06D85S/T).
■	VEP07A23N	TV DEMODULATOR PACK C.B.A	(RTL)[SUPPLIED FROM MBV]NV-SJ220EG-K/EG-S/EGNK/EGMK/EGYS
			INCLUDED IN MAIN C.B.A.(VEP06D85R,VEP06E00L).
■	----------	CYLINDER STATOR C.B.A.	INCLUDED IN CYLINDER UNIT (VEG1522).
■	----------	CAPSTAN DRIVE C.B.A.	INCLUDED IN CAPSTAN UNIT (VEK9069).
■	VEP06D85S	MAIN C.B.A.	(RTL)[SUPPLIED FROM MBV]NV-SJ220B-S
■	VEP06D85T	MAIN C.B.A.	(RTL)[SUPPLIED FROM MBV]NV-SJ220BL-S
■	VEP06D85R	MAIN C.B.A.	(RTL)[SUPPLIED FROM MBV]NV-SJ220EG-K/EG-S/EGNK/EGMK
■	VEP06E00L	MAIN C.B.A.	(RTL)[SUPPLIED FROM MBV]NV-SJ220EGYS
C0701	ECUM1C105ZFN	C.CAPACITOR CH 16V 1U	
C0702	ECUX1H102KBV	C.CAPACITOR CH 50V 1000P	
C0703	ECUM1A105KBN	C.CAPACITOR CH 10V 1U	
C0704	ECUM1E333KBN	C.CAPACITOR CH 25V 0.033U	
C0705	ECUX1H150JCV	C.CAPACITOR CH 50V 15P	NV-SJ220EG-K/EG-S/EGNK/EGMK/EGYS
C0706	ECEA1HKA010	E.CAPACITOR 50V 1U	

Ref. No.	Part No.	Part Name & Description	Remarks
C0707	ECEA1HKA2R2	E.CAPACITOR 50V 2.2U	
C0708	ECEA1HKAR47	E.CAPACITOR 50V 0.47U	
C0709	ECUX1H470JCV	C.CAPACITOR CH 50V 47P	
C0710	ECUX1H103ZFV	C.CAPACITOR CH 50V 0.01U	
C0711	ECEA1CKA220	E.CAPACITOR 16V 22U	
C0712	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	
C0713	ECEA0JKA331	E.CAPACITOR 6.3V 330U	
C0714	ECUM1C105ZFN	C.CAPACITOR CH 16V 1U	
C0715	ECUX1H120JCV	C.CAPACITOR CH 50V 12P	NV-SJ220B-S/BL-S
C0715	ECUX1H030CCV	C.CAPACITOR CH 50V 3P	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
C0716	ECUX1E223KBV	C.CAPACITOR CH 25V 0.022U	
C0717	ECUM1H330GUV	C.CAPACITOR CH 50V 33P	
C0718	ECEA1CKN100	E.CAPACITOR 16V 10U	
C0719	ECUX1E104ZFV	C.CAPACITOR CH 25V 0.1U	
C0721	ECUX1H820JCV	C.CAPACITOR CH 50V 82P	NV-SJ220B-S/BL-S
C0721	ECUX1H121JCV	C.CAPACITOR CH 50V 120P	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
C0722	ERJ3GEYJ123	M.RESISTOR CH 1/16W 12K	
C0724	ECUX1H331KBV	C.CAPACITOR CH 50V 330P	NV-SJ220B-S/BL-S
C0724	ECUX1H221KBV	C.CAPACITOR CH 50V 220P	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
C1002	VCEA1ACB220	E.CAPACITOR 10V 22U	[SUPPLIED FROM MBV]
C1003	ECUX1H103ZFV	C.CAPACITOR CH 50V 0.01U	
C1004	VCEA1CCB470	E.CAPACITOR 16V 47U	
C1006	ECUX1H103ZFV	C.CAPACITOR CH 50V 0.01U	
C1007	ECEA1CGE100	E.CAPACITOR 16V 10U	
C1008	ECEA1HGE470	E.CAPACITOR 50V 47U	
C1010	VCEA1CCB470	E.CAPACITOR 16V 47U	
C1011	ECUX1H103ZFV	C.CAPACITOR CH 50V 0.01U	
C1013	VCEA1CCB100	E.CAPACITOR 16V 10U	
C1101	ECKMNA102MEV	CERAMIC CAPACITOR	⚠
C1102	ECQB1H103JF	P.CAPACITOR 50V 0.01U	
C1104	ECKMNA102MEV	CERAMIC CAPACITOR	⚠
C1106	ECKF1H102KB	C.CAPACITOR 50V 1000P	
C1107	ECKMNA102MEV	CERAMIC CAPACITOR	⚠
C1108	ECCZ3A680KGE	C.CAPACITOR 1KV 68P	[SUPPLIED FROM MBV]
C1109	ECKD2H103PU	C.CAPACITOR 500V 0.01U	
C1110	ECA1AHJ331	E.CAPACITOR 10V 330U	[SUPPLIED FROM MBV]
C1111	ECKF1H102KB	C.CAPACITOR 50V 1000P	
C1112	ECQB1H822JF	P.CAPACITOR 50V 8200P	
C1114	ECA1HHJ470	E.CAPACITOR 50V 47U	[SUPPLIED FROM MBV]
C1118	ECQU2A683MVA	P.CAPACITOR 100V 0.068U	⚠
C1120	ECEC2GG330	E.CAPACITOR 400V 33U	
C1122	ECKF1H121KB	C.CAPACITOR 50V 120P	
C1131	EEUFG1E821	E.CAPACITOR 25V 820P	[SUPPLIED FROM MBV]
C1132	ECA1EHJ331	E.CAPACITOR 25V 330U	[SUPPLIED FROM MBV]
C1134	EEUFG1A122	E.CAPACITOR 10V 1200P	[SUPPLIED FROM MBV]
C1135	ECA1AHJ331	E.CAPACITOR 10V 330U	[SUPPLIED FROM MBV]
C1136	ECKD2H101KB	C.CAPACITOR 500V 100P	
C1137	ECA1HHJ470	E.CAPACITOR 50V 47U	[SUPPLIED FROM MBV]
C1138	ECUX1H103ZFV	C.CAPACITOR CH 50V 0.01U	
C1139	ECKD2H221KB	C.CAPACITOR 500V 220P	
C1140	ECA1HHJ101	E.CAPACITOR 50V 100U	[SUPPLIED FROM MBV]

Ref. No.	Part No.	Part Name & Description	Remarks
C1141	ECKF1H103ZF	C.CAPACITOR 50V 0.01U	
C1142	ECKD2H221KB	C.CAPACITOR 500V 220P	
C1143	EEUFG1A331	E.CAPACITOR 10V 330P	[SUPPLIED FROM MBV]
C1202	VCEA0JCB101	E.CAPACITOR 6.3V 100U	
C1204	VCEA1ACB220	E.CAPACITOR 10V 22U	[SUPPLIED FROM MBV]
C1205	ECUX1H103ZFV	C.CAPACITOR CH 50V 0.01U	
C1206	ECUX1H103ZFV	C.CAPACITOR CH 50V 0.01U	
C1207	VCEA0JCB470	E.CAPACITOR 6.3V 47U	
C1208	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	
C1502	ECUX1H331JCV	C.CAPACITOR CH 50V 330P	
C2502	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	
C2505	ECUM1C563KBV	C.CAPACITOR CH 16V 0.056U	
C2506	ECUM1C563KBV	C.CAPACITOR CH 16V 0.056U	
C2507	ECUM1C563KBV	C.CAPACITOR CH 16V 0.056U	
C2508	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	
C2509	ECUM1C474ZFV	C.CAPACITOR CH 16V 0.47U	[SUPPLIED FROM MBV]
C2510	ECUX1H330JCV	C.CAPACITOR CH 50V 33P	
C2511	ECEA0JKN220	E.CAPACITOR 6.3V 22U	
C2512	VCEA1ECB4R7	E.CAPACITOR 25V 4.7U	
C2513	ECUX1H392KBV	C.CAPACITOR CH 50V 3900P	
C2515	ECEA1VKN4R7	E.CAPACITOR 35V 4.7U	
C2516	ECEA1VKN4R7	E.CAPACITOR 35V 4.7U	
C2517	ECA0JHJ221	E.CAPACITOR 6.3V 220U	[SUPPLIED FROM MBV]
C2518	ECUM1H473ZFV	C.CAPACITOR CH 50V 0.047U	
C2519	VCEA1ECB470	E.CAPACITOR 25V 47U	
C2520	ECUM1E683KBN	C.CAPACITOR CH 25V 0.068U	
C2521	ECUM1C154KBN	C.CAPACITOR CH 16V 0.15U	
C2522	ECUM1C154KBN	C.CAPACITOR CH 16V 0.15U	
C2523	ECUM1C154KBN	C.CAPACITOR CH 16V 0.15U	
C2524	ECEA1VKN4R7	E.CAPACITOR 35V 4.7U	
C3002	ECUX1H102KBV	C.CAPACITOR CH 50V 1000P	
C3003	ECUX1H102KBV	C.CAPACITOR CH 50V 1000P	
C3004	VCEA1HCB010	E.CAPACITOR 50V 1U	
C3008	ECUX1H680JCV	C.CAPACITOR CH 50V 68P	
C3009	ECUX1H070DCV	C.CAPACITOR CH 50V 7P	
C3012	ECUX1C104KBV	C.CAPACITOR CH 16V 0.1U	
C3013	ECUX1H103ZFV	C.CAPACITOR CH 50V 0.01U	
C3015	ECUX1H103ZFV	C.CAPACITOR CH 50V 0.01U	
C3016	ECUX1H103ZFV	C.CAPACITOR CH 50V 0.01U	
C3017	VCEA0JCB221	E.CAPACITOR 6.3V 220U	
C3018	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	
C3019	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	
C3020	VCEA1HCB010	E.CAPACITOR 50V 1U	
C3021	ECUX1H103KBV	C.CAPACITOR CH 50V 0.01U	
C3022	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	
C3023	VCEA0JCB101	E.CAPACITOR 6.3V 100U	
C3024	ECUX1C104KBV	C.CAPACITOR CH 16V 0.1U	
C3025	ECUX1H222KBV	C.CAPACITOR CH 50V 2200P	
C3028	VCEA0JCB470	E.CAPACITOR 6.3V 47U	
C3029	VCEA0JCB101	E.CAPACITOR 6.3V 100U	
C3030	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	
C3031	ECUX1H103ZFV	C.CAPACITOR CH 50V 0.01U	
C3032	ECUX1H222KBV	C.CAPACITOR CH 50V 2200P	
C3033	VCEA1HCBR47	E.CAPACITOR 50V 0.47U	

Ref. No.	Part No.	Part Name & Description	Remarks
C3035	ECEA1EKN4R7	E.CAPACITOR 25V 4.7U	
C3036	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	
C3037	VCEA0JCB221	E.CAPACITOR 6.3V 220U	
C3038	VCEA1ECB4R7	E.CAPACITOR 25V 4.7U	
C3039	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	
C3040	VCEA0JCB101	E.CAPACITOR 6.3V 100U	
C3041	VCEA1ACB220	E.CAPACITOR 10V 22U	[SUPPLIED FROM MBV]
C3042	ECUX1E223KBV	C.CAPACITOR CH 25V 0.022U	
C3043	VCEA1CCB100	E.CAPACITOR 16V 10U	
C3045	ECUX1H560JCV	C.CAPACITOR CH 50V 56P	
C3046	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	
C3047	ECYX1H821JCV	C.CAPACITOR CH 50V 820P	
C3048	ECUX1H221JCV	C.CAPACITOR CH 50V 220P	
C3050	VCEA1ACB220	E.CAPACITOR 10V 22U	[SUPPLIED FROM MBV]
C3051	ECUX1H681JCV	C.CAPACITOR CH 50V 680P	
C3052	ECUX1H820JCV	C.CAPACITOR CH 50V 82P	
C3053	ECUX1H680JCV	C.CAPACITOR CH 50V 68P	
C3054	ECUX1H680JCV	C.CAPACITOR CH 50V 68P	
C3501	VCEA0JCC470	E.CAPACITOR 6.3V 47U	[SUPPLIED FROM MBV]
C3502	ECUX1H103KBV	C.CAPACITOR CH 50V 0.01U	
C3505	ECUX1H103KBV	C.CAPACITOR CH 50V 0.01U	
C3508	ECUX1C104KBV	C.CAPACITOR CH 16V 0.1U	
C3509	ECUX1C104KBV	C.CAPACITOR CH 16V 0.1U	
C3510	ECUX1C104KBV	C.CAPACITOR CH 16V 0.1U	
C3511	ECUX1C104KBV	C.CAPACITOR CH 16V 0.1U	
C4001	ECUM1H222JN	C.CAPACITOR CH 50V 2200P	NV-SJ220B-S/BL-S
C4002	ECUX1C104KBV	C.CAPACITOR CH 16V 0.1U	
C4003	ECQB1H822JF	P.CAPACITOR 50V 8200P	
C4004	VCEA1ACB220	E.CAPACITOR 10V 22U	[SUPPLIED FROM MBV]
C4005	VCEA1HCB010	E.CAPACITOR 50V 1U	
C4006	ECUX1H272KBV	C.CAPACITOR CH 50V 2700P	NV-SJ220B-S/BL-S
C4007	ECUM1H122JCN	C.CAPACITOR CH 50V 1200P	
C4008	VCEA1ECB4R7	E.CAPACITOR 25V 4.7U	
C4009	ECUM1C105ZFN	C.CAPACITOR CH 16V 1U	NV-SJ220B-S/BL-S
C4010	ECUM1E273KBV	C.CAPACITOR CH 25V 0.027U	NV-SJ220B-S/BL-S
C4011	ECUX1H153KBV	C.CAPACITOR CH 50V 0.015U	
C4013	ECUX1H153KBV	C.CAPACITOR CH 50V 0.015U	NV-SJ220B-S/BL-S
C4014	VCEA1HCB010	E.CAPACITOR 50V 1U	
C4015	VCEA0JCB470	E.CAPACITOR 6.3V 47U	
C4016	ECUX1C104KBV	C.CAPACITOR CH 16V 0.1U	
C4017	VCEA1ACB220	E.CAPACITOR 10V 22U	[SUPPLIED FROM MBV]
C4018	ECUX1C104KBV	C.CAPACITOR CH 16V 0.1U	
C4019	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	
C4020	VCEA0JCB470	E.CAPACITOR 6.3V 47U	
C4026	VCEA1ACB220	E.CAPACITOR 10V 22U	[SUPPLIED FROM MBV]
C4027	VCEA1CCB100	E.CAPACITOR 16V 10U	
C4028	ECUX1E223KBV	C.CAPACITOR CH 25V 0.022U	
C4029	ECUX1H152KBV	C.CAPACITOR CH 50V 1500P	
C4030	VCEA0JCB221	E.CAPACITOR 6.3V 220U	
C4031	ECQB1H223JF	P.CAPACITOR 50V 0.022U	
C4032	ECUX1H221JCV	C.CAPACITOR CH 50V 220P	
C4033	ECUX1H101JCV	C.CAPACITOR CH 50V 100P	NV-SJ220B-S/BL-S
C4903	ECUX1H181JCV	C.CAPACITOR CH 50V 180P	NV-SJ220B-S/BL-S
C4906	ECUX1H102KBV	C.CAPACITOR CH 50V 1000P	NV-SJ220B-S/BL-S

Ref. No.	Part No.	Part Name & Description	Remarks
C4907	ECUX1H470JCV	C.CAPACITOR CH 50V 47P	NV-SJ220B-S/BL-S
C4908	ECUX1H470JCV	C.CAPACITOR CH 50V 47P	NV-SJ220B-S/BL-S
C4909	ECUX1H470JCV	C.CAPACITOR CH 50V 47P	
C4910	ECUX1H470JCV	C.CAPACITOR CH 50V 47P	
C4913	ECUX1H181JCV	C.CAPACITOR CH 50V 180P	NV-SJ220B-S/BL-S
C4913	ECUX1H101JCV	C.CAPACITOR CH 50V 100P	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
C4914	ECUX1H102KBV	C.CAPACITOR CH 50V 1000P	NV-SJ220B-S/BL-S
C4914	ECUX1H222KBV	C.CAPACITOR CH 50V 2200P	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
C4916	ECUX1C104KBV	C.CAPACITOR CH 16V 0.1U	NV-SJ220B-S/BL-S
C4917	ECUX1C104KBV	C.CAPACITOR CH 16V 0.1U	NV-SJ220B-S/BL-S
C4918	VCEA1HCB010	E.CAPACITOR 50V 1U	NV-SJ220B-S/BL-S
C4919	ECUX1C104KBV	C.CAPACITOR CH 16V 0.1U	NV-SJ220B-S/BL-S
C4920	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	NV-SJ220B-S/BL-S
C4921	VCEA0JCB221	E.CAPACITOR 6.3V 220U	NV-SJ220B-S/BL-S
C4922	ECUX1C104KBV	C.CAPACITOR CH 16V 0.1U	NV-SJ220B-S/BL-S
C4924	VCEA1HCB010	E.CAPACITOR 50V 1U	NV-SJ220B-S/BL-S
C4925	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	NV-SJ220B-S/BL-S
C4926	VCEA0JCB221	E.CAPACITOR 6.3V 220U	NV-SJ220B-S/BL-S
C4927	VCEA0JEC471	E.CAPACITOR 6.3V 470U	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
C4928	ECUX1C104KBV	C.CAPACITOR CH 16V 0.1U	NV-SJ220B-S/BL-S
C4936	ECUX1C104KBV	C.CAPACITOR CH 16V 0.1U	NV-SJ220B-S/BL-S
C4937	ECUX1C104KBV	C.CAPACITOR CH 16V 0.1U	NV-SJ220B-S/BL-S
C4938	VCEA1CCB470	E.CAPACITOR 16V 47U	NV-SJ220B-S/BL-S
C4939	ECUX1C104KBV	C.CAPACITOR CH 16V 0.1U	NV-SJ220B-S/BL-S
C4940	VCEA1CCB470	E.CAPACITOR 16V 47U	NV-SJ220B-S/BL-S
C4941	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	NV-SJ220B-S/BL-S
C4942	ECUX1C104KBV	C.CAPACITOR CH 16V 0.1U	NV-SJ220B-S/BL-S
C4943	VCEA1HCB010	E.CAPACITOR 50V 1U	NV-SJ220B-S/BL-S
C4945	ECUX1C104KBV	C.CAPACITOR CH 16V 0.1U	NV-SJ220B-S/BL-S
C4946	ECUX1H222KBV	C.CAPACITOR CH 50V 2200P	
C4947	ERJ3GEY0R00	M.RESISTOR CH 1/16W 0	NV-SJ220B-S/BL-S
C6001	VCEA0JCB470	E.CAPACITOR 6.3V 47U	
C6002	ECUX1H151JCV	C.CAPACITOR CH 50V 150P	
C6003	ECUX1H471JCV	C.CAPACITOR CH 50V 470P	
C6004	ECUX1H103ZFV	C.CAPACITOR CH 50V 0.01U	
C6005	ECUX1H103ZFV	C.CAPACITOR CH 50V 0.01U	
C6008	ECUX1H102KBV	C.CAPACITOR CH 50V 1000P	
C6009	ECUX1H180JCV	C.CAPACITOR CH 50V 18P	
C6010	ECUX1H180JCV	C.CAPACITOR CH 50V 18P	
C6011	ECUX1H180JCV	C.CAPACITOR CH 50V 18P	
C6012	ECUX1H150JCV	C.CAPACITOR CH 50V 15P	
C6013	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	
C6014	ECUX1H102KBV	C.CAPACITOR CH 50V 1000P	
C6015	VCEA1CCB100	E.CAPACITOR 16V 10U	
C6016	ECUX1H103ZFV	C.CAPACITOR CH 50V 0.01U	
C6017	ECUX1H681JCV	C.CAPACITOR CH 50V 680P	
C7501	ECUX1H103ZFV	C.CAPACITOR CH 50V 0.01U	
C7502	VCEA1HCB100	E.CAPACITOR 50V 10U	
C7503	ECUX1H120JCV	C.CAPACITOR CH 50V 12P	
C7504	VCEA0JCB101	E.CAPACITOR 6.3V 100U	
C7507	VCE0073	SUPER CAPACITOR	

Ref. No.	Part No.	Part Name & Description	Remarks
C7508	VCEA0JCB221	E.CAPACITOR 6.3V 220U	
C7509	ECUX1C683ZFV	C.CAPACITOR CH 16V 0.068U	
C7510	ECUX1H103ZFV	C.CAPACITOR CH 50V 0.01U	
C7511	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	
C7603	VCEA0JCB101	E.CAPACITOR 6.3V 100U	
C7604	VCEA0JCB101	E.CAPACITOR 6.3V 100U	
C7607	ECUX1H221JCV	C.CAPACITOR CH 50V 220P	
C7608	ECUX1H221JCV	C.CAPACITOR CH 50V 220P	
C7609	ECUX1H221JCV	C.CAPACITOR CH 50V 220P	
C7610	VCEA1HCB100	E.CAPACITOR 50V 10U	
C7611	ECUM1H221JCN	C.CAPACITOR CH 50V 220P	
C7612	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	
C7614	ECUX1H330JCV	C.CAPACITOR CH 50V 33P	
C7615	ECUX1H330JCV	C.CAPACITOR CH 50V 33P	
C7616	VCEA0JCB101	E.CAPACITOR 6.3V 100U	
C7617	ECUX1H103ZFV	C.CAPACITOR CH 50V 0.01U	
C7619	ECUX1H330JCV	C.CAPACITOR CH 50V 33P	NV-SJ220B-S
C7620	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	
C7701	ECUX1H151JCV	C.CAPACITOR CH 50V 150P	
C7702	ECUM1C474ZFV	C.CAPACITOR CH 16V 0.47U	[SUPPLIED FROM MBV]
C7703	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	
C7704	VCEA0JCB470	E.CAPACITOR 6.3V 47U	
C7705	ECUX1H222KBV	C.CAPACITOR CH 50V 2200P	
C7706	ECUX1C333KBV	C.CAPACITOR CH 16V 0.033U	
C7707	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	
C7711	ECUX1H221JCV	C.CAPACITOR CH 50V 220P	
C7712	ECUM1C105ZFN	C.CAPACITOR CH 16V 1U	
C7713	VCEA0JCB470	E.CAPACITOR 6.3V 47U	
D0702	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	
D1002	1SS254	DIODE	B0AAED000003
D1003	MA4051N-H	DIODE	[SUPPLIED FROM MBV]
D1006	MA4051N-M	DIODE	
D1007	1SS254	DIODE	B0AAED000003
D1008	MA4130N-L	DIODE	
D1102	S1WBA80-4062	BRIDGE DIODE	B0EBKT000002
D1103	AP01C	DIODE	B0HADV000010
D1104	MA185	DIODE	
D1105	1SS254	DIODE	B0AAED000003
D1106	1SS254	DIODE	B0AAED000003
D1107	1SS254	DIODE	B0AAED000003
D1114	21DQ06FC4	DIODE	B0JAMG000013
D1118	ERG1SJ223	M.RESISTOR 1W 22K	
D1121	RL2ZP	DIODE	
D1123	ERA22-04	DIODE	
D1124	ERA22-04	DIODE	
D1125	11EQS06	DIODE	
D1130	MA7300B	DIODE	
D1201	MA4051N-M	DIODE	
D1202	1SS254	DIODE	B0AAED000003
D1501	SIR505S	DIODE	B3EA00000040
D2501	1SS254	DIODE	B0AAED000003
D2502	1SS254	DIODE	B0AAED000003
D2503	B0EAKL000031	DIODE	

Ref. No.	Part No.	Part Name & Description	Remarks
D2504	B0EAKL000031	DIODE	
D3001	1SS254	DIODE	B0AAED000003
D4901	MA4051N-M	DIODE	
D4902	MA4051N-M	DIODE	
D4903	1SS254	DIODE	NV-SJ220B-S/BL-S B0AAED000003
D4904	1SS254	DIODE	B0AAED000003
D7501	MA4220N-M	DIODE	[SUPPLIED FROM MBV]
D7503	RB441P	DIODE	
D7601	MA4300M	DIODE	
DP7501	A2BD00000040	DISPLAY TUBE	[SUPPLIED FROM MBV]
F1101	XBA2C16TB0	FUSE	⚠
IC0701	LA75503	IC	
IC1101	C5HACZZ00002	IC	[SUPPLIED FROM MBV]
IC1102	UPC1093J	IC	
IC1501	RPI354N	IC	B3EZ00000001
IC1502	RPI354N	IC	B3EZ00000001
IC2501	AN3811NK	IC	
IC3001	AN3531NFBS	IC	
IC3501	AN3365SB	IC	
IC4901	LA73020M		NV-SJ220B-S/BL-S
IC6001	C2CBJG000139	IC	[SUPPLIED FROM MBV]
IC7501	M35502AFP	IC	
IC7502	PNA4611M08VT	PHOTO DIODE	
IC7503	RN5VD28AA	IC	
IC7504	S80743AL	IC	C0EAH0000066
IC7701	C1AB00001293	IC	[SUPPLIED FROM MBV]
IC7702	M24C16-WBN6	IC	C3EAGC000015
IP1001	UNH000300A	IC PROTECTOR	⚠
IP1002	UNH001200A	IC PROTECTOR	⚠
IP1003	UNH000300A	IC PROTECTOR	⚠
IP1004	UNH000300A	IC PROTECTOR	⚠
IP1101	VSF0015A10	FUSE	⚠
JK4902	K1FB121B0003	SOCKET	[SUPPLIED FROM MBV]NV-SJ220B-S/BL-S
JK4903	K1FB121B0003	SOCKET	[SUPPLIED FROM MBV]
K0703	ERJ3GEY0R00	M.RESISTOR CH 1/16W 0	
K0707	ERJ3GEY0R00	M.RESISTOR CH 1/16W 0	
K0708	ERJ3GEY0R00	M.RESISTOR CH 1/16W 0	NV-SJ220EG-K/EG-S/EGNK/EGMK/EGYS
K0709	ERJ3GEY0R00	M.RESISTOR CH 1/16W 0	
K3003	ERJ6GMZ0R00	M.RESISTOR CH 1/10W 0	
K3503	ERJ6GMZ0R00	M.RESISTOR CH 1/10W 0	
K3504	ERJ6GMZ0R00	M.RESISTOR CH 1/10W 0	
K3505	ERJ6GMZ0R00	M.RESISTOR CH 1/10W 0	
K3506	ERJ6GMZ0R00	M.RESISTOR CH 1/10W 0	
K3507	ERJ6GMZ0R00	M.RESISTOR CH 1/10W 0	
K3508	ERJ6GMZ0R00	M.RESISTOR CH 1/10W 0	
K3509	ERJ6GMZ0R00	M.RESISTOR CH 1/10W 0	

Ref. No.	Part No.	Part Name & Description	Remarks
K4004	ERJ6GMZ0R00	M.RESISTOR CH 1/10W 0	
K4007	ERJ6GMZ0R00	M.RESISTOR CH 1/10W 0	
K4901	ERJ6GMZ0R00	M.RESISTOR CH 1/10W 0	NV-SJ220B-S/BL-S
K4903	ERJ6GMZ0R00	M.RESISTOR CH 1/10W 0	
K4904	ERJ6GMZ0R00	M.RESISTOR CH 1/10W 0	
K4915	ERJ6GMZ0R00	M.RESISTOR CH 1/10W 0	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
K4916	ERJ6GMZ0R00	M.RESISTOR CH 1/10W 0	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
K7501	ERJ6GMZ0R00	M.RESISTOR CH 1/10W 0	
K7603	ERJ6GMZ0R00	M.RESISTOR CH 1/10W 0	
K7605	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	
L0701	ELJNAR22JF	CHIP INDUCTOR	NV-SJ220B-S/BL-S
L0701	ELJNAR18JF	CHIP INDUCTOR	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
L0703	ELJNA1R8JF	CHIP INDUCTOR	NV-SJ220B-S/BL-S
L0703	ELJNA2R2JF	INDUCTOR 2.2UH	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
L0705	ELESE330KA	INDUCTOR 33UH	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
L1107	ELF15N005A	LINE FILTER	⚠
L1108	ELF15N003A	LINE FILTER	⚠
L1121	VLQ0655K220	COIL 22UH	
L1122	G0A220G00018	COIL	[SUPPLIED FROM MBV]G0A220G00019
L1123	VLQ0599J101	COIL 100UH	
L1124	VLQ0599J101	COIL 100UH	
L2501	VLQ0599J680	COIL 68UH	
L3002	VLQ0599J220	COIL 22UH	
L3005	VLQ0599J470	COIL 47UH	
L3006	VLQ0599J101	COIL 100UH	
L3007	VLQ0599J680	COIL 68UH	
L3008	VLQ0599J101	COIL 100UH	
L3009	VLQ0599J330	COIL 33UH	
L3010	VLQ0599J470	COIL 47UH	
L3011	VLQ0599J390	COIL 39UH	
L3012	VLQ0599J560	COIL 56UH	
L3501	VLQ0599J330	COIL 33UH	
L4001	ELELN153JA	INDUCTOR 15000UH	
L4003	VLQ0599J680	COIL 68UH	
L4901	VLQ0599JR22	COIL 0.22UH	
L4902	VLQ0599J680	COIL 68UH	NV-SJ220B-S/BL-S
L4903	VLQ0599J680	COIL 68UH	NV-SJ220B-S/BL-S
L6001	VLQ0599J101	COIL 100UH	
L7601	VLQ0599J330	COIL 33UH	
L7602	VLQ0599J330	COIL 33UH	
L7603	VLQ0599J330	COIL 33UH	
L7604	VLQ0599J330	COIL 33UH	
L7609	VLQ0599J100	COIL 10UH	
L7701	VLQ0599J680	COIL 68UH	
L7703	VLQ0599J680	COIL 68UH	
LB1105	VLP0056	FERRITE BEAD	
LB3503	VLP0147	COIL	
LB3504	VLP0147	COIL	

Ref. No.	Part No.	Part Name & Description	Remarks
LB4904	ERJ6GMYJ221	M.RESISTOR CH 1/10W 220	NV-SJ220B-S/BL-S
LB4906	ERJ6GMYJ221	M.RESISTOR CH 1/10W 220	
P1101	VJS3306	AC INLET	⚠ K2AA2G000002
P1501	VJS3837A002	CONNECTOR (FEMALE) 2P	K1KB02A00035
P2501	VJP3835A012	CONNECTOR (MALE) 12P	
P2502	VJS3537A009G	CONNECTOR (FEMALE) 9P	K1MN09A00012
P3502	VJS3537A005G	CONNECTOR (FEMALE) 5P	K1MN05A00020
P4002	VJS3837A002	CONNECTOR (FEMALE) 2P	K1KB02A00035
P4003	VJS3537A006G	CONNECTOR (FEMALE) 6P	K1MN06A00034
PK0701	VJR0826E009W	CONNECTOR (MALE) 9P	K1MR09A00028
PP0701	VJP3589A004B	CONNECTOR (MALE) 4P	
Q0701	2SD601A-S	TRANSISTOR	
Q0702	2SD601A-S	TRANSISTOR	
Q1002	2SD602A	TRANSISTOR	
Q1003	2SD1996-S	TRANSISTOR	
Q1004	2SD1996-S	TRANSISTOR	
Q1005	2SD602A-R	TRANSISTOR	
Q1006	2SD601A	TRANSISTOR	
Q1007	2SD1996-S	TRANSISTOR	
Q1008	2SB710A	TRANSISTOR	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
Q1101	2SD1996-S	TRANSISTOR	
Q1102	2SB1030A	TRANSISTOR	
Q1111	PC123ZY2	PHOTO COUPLER	⚠ B3PBA0000078
Q1201	2SD1996-S	TRANSISTOR	
Q1202	2SD1996-S	TRANSISTOR	
Q1501	PNB2301MBV	TRANSISTOR	
Q1502	PNB2301MAV	TRANSISTOR	
Q4001	2SD601A	TRANSISTOR	
Q4002	2SD601A	TRANSISTOR	
Q4005	2SB710-R	TRANSISTOR	
Q4006	2SD602A-R	TRANSISTOR	
Q4901	2SD601A	TRANSISTOR	
Q4903	2SD601A	TRANSISTOR	NV-SJ220B-S/BL-S
Q4904	2SB709A	TRANSISTOR	
Q7601	2SB709A	TRANSISTOR	
Q7701	2SB709A	TRANSISTOR	
Q7705	2SD601A	TRANSISTOR	
QR1001	UN2112	TRANSISTOR	
QR1002	UN2211	TRANSISTOR	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
QR1201	UN2212	TRANSISTOR-RESISTOR	
QR4001	UN2212	TRANSISTOR-RESISTOR	NV-SJ220B-S/BL-S
QR4002	UN2211	TRANSISTOR	NV-SJ220B-S/BL-S
QR4003	UN2111	TRANSISTOR	
QR4004	UN2215	TRANSISTOR-RESISTOR	
QR4005	UN2113	TRANSISTOR-RESISTOR	
QR4008	UN2215	TRANSISTOR-RESISTOR	NV-SJ220B-S/BL-S
QR4009	UN2215	TRANSISTOR-RESISTOR	NV-SJ220B-S/BL-S

Ref. No.	Part No.	Part Name & Description	Remarks
QR4903	UN2212	TRANSISTOR-RESISTOR	NV-SJ220B-S/BL-S
QR4904	UN2215	TRANSISTOR-RESISTOR	
QR4905	UN2215	TRANSISTOR-RESISTOR	
QR6001	UN2215	TRANSISTOR-RESISTOR	
QR6006	UN2211	TRANSISTOR	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
QR7601	UN2215	TRANSISTOR-RESISTOR	
QR7602	UN2113	TRANSISTOR-RESISTOR	
R0701	ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	NV-SJ220B-S/BL-S
R0705	ERJ3GEYJ472	M.RESISTOR CH 1/16W 4.7K	
R0707	ERJ3GEYJ393	M.RESISTOR CH 1/16W 39K	
R0708	ERJ3GEYJ332	M.RESISTOR CH 1/16W 3.3K	
R0711	ERJ3GEYJ181	M.RESISTOR CH 1/16W 180	
R0715	ERJ3GEYJ223	M.RESISTOR CH 1/16W 22K	
R0717	ERJ3GEYJ471	M.RESISTOR CH 1/16W 470	
R0719	ERJ3GEYJ472	M.RESISTOR CH 1/16W 4.7K	
R0723	ERJ3GEY0R00	M.RESISTOR CH 1/16W 0	
R0724	ERJ3GEY0R00	M.RESISTOR CH 1/16W 0	
R0725	ERJ6GEYJ101	M.RESISTOR CH 1/10W 100	
R0726	ERJ3GEYJ683	M.RESISTOR CH 1/16W 68K	
R0727	ERJ3GEY0R00	M.RESISTOR CH 1/16W 0	
R0728	ERJ3GEY0R00	M.RESISTOR CH 1/16W 0	NV-SJ220B-S/BL-S
R0729	ERJ3GEYJ103	M.RESISTOR CH 1/16W 10K	
R0730	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
R0733	ERJ3GEYJ221	M.RESISTOR CH 1/16W 220	
R0734	ERJ3GEYJ392	M.RESISTOR CH 1/16W 3.9K	
R0737	ERJ3GEYJ102	M.RESISTOR CH 1/16W 1K	NV-SJ220B-S/BL-S
R0737	ERJ3GEYJ331	M.RESISTOR CH 1/16W 330	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
R0739	ERJ3GEYJ472	M.RESISTOR CH 1/16W 4.7K	
R0740	ERJ3GEYG471	M.RESISTOR CH 1/16W 470	
R0741	ERJ3GEYJ221	M.RESISTOR CH 1/16W 220	
R0742	ERJ8GEYJ151	M.RESISTOR CH 1/8W 150	
R0745	ERJ6GEYJ335	M.RESISTOR CH 1/10W 3.3M	
R0746	ERJ6GEYJ564	M.RESISTOR CH 1/10W 560K	
R1002	ERJ6GMYJ683	M.RESISTOR CH 1/10W 68K	
R1003	ERJ6GMYJ683	M.RESISTOR CH 1/10W 68K	
R1004	ERJ6GMYJ563	M.RESISTOR CH 1/10W 56K	
R1005	ERJ6GMYJ563	M.RESISTOR CH 1/10W 56K	
R1006	ERJ6GMYJ103	M.RESISTOR CH 1/10W 10K	
R1007	ERJ6GMYJ103	M.RESISTOR CH 1/10W 10K	
R1008	ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	
R1009	ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	
R1011	ERJ6GMYJ562	M.RESISTOR CH 1/10W 5.6K	
R1012	ERDS2TJ182	C.RESISTOR 1/4W 1.8K	
R1017	ERDS2TJ272	C.RESISTOR 1/4W 2.7K	
R1023	ERDS2TJ822	C.RESISTOR 1/4W 8.2K	
R1025	ERJ6GMYJ472	M.RESISTOR CH 1/10W 4.7K	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
R1026	ERJ6GMYJ103	M.RESISTOR CH 1/10W 10K	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
R1027	ERJ6GMYJ103	M.RESISTOR CH 1/10W 10K	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS

Ref. No.	Part No.	Part Name & Description	Remarks
R1101	ERJ6GMYJ272	M.RESISTOR CH 1/10W 2.7K	
R1102	ERG1SJ223	M.RESISTOR 1W 22K	
R1103	ERDS2FJ123	C.RESISTOR 1/4W 12K	
R1104	ERDS2FJ123	C.RESISTOR 1/4W 12K	
R1105	ERDS2FJ105	C.RESISTOR 1/4W 1M	
R1106	ERDS2FJ105	C.RESISTOR 1/4W 1M	
R1107	ERDS2FJ104	C.RESISTOR 1/4W 100K	
R1108	ERDS2FJ123	C.RESISTOR 1/4W 12K	
R1109	ERDS2FJ152	C.RESISTOR 1/4W 1.5K	
R1110	ERDS2FJ123	C.RESISTOR 1/4W 12K	
R1111	ERDS2FJ471	C.RESISTOR 1/4W 470	
R1112	ERDS2FJ102	C.RESISTOR 1/4W 1K	
R1113	ERX1SJR68	M.RESISTOR 1W 0.68	
R1114	ERDS2FJ222	C.RESISTOR 1/4W 2.2K	
R1115	ERDS1TJ470	C.RESISTOR 1/2W 47	
R1116	ERJ6GMYJ102	M.RESISTOR CH 1/10W 1K	
R1117	ERDS2FJ123	C.RESISTOR 1/4W 12K	
R1118	ERDS2FJ101	C.RESISTOR 1/4W 100	
R1119	ERJ6GMYJ273	M.RESISTOR CH 1/10W 27K	
R1120	ERJ6RBD222	M.RESISTOR CH 1/10W 2.2K	
R1121	ERJ6RBD272	M.RESISTOR CH 1/10W 2.7K	
R1123	ERDS2FJ222	C.RESISTOR 1/4W 2.2K	
R1124	ERDS2FJ223	C.RESISTOR 1/4W 22K	
R1125	ERJ6GMYJ101	M.RESISTOR CH 1/10W 100	
R1126	ERDS2FJ123	C.RESISTOR 1/4W 12K	
R1204	ERDS2TJ102	C.RESISTOR 1/4W 1K	
R1501	ERDS2TJ121	C.RESISTOR 1/4W 120	
R1502	ERDS2TJ181	C.RESISTOR 1/4W 180	
R1503	ERJ6GMYJ273	M.RESISTOR CH 1/10W 27K	
R1504	ERJ6GMYJ273	M.RESISTOR CH 1/10W 27K	
R1505	ERJ6GMYJ101	M.RESISTOR CH 1/10W 100	
R2501	ERJ6GMZ0R00	M.RESISTOR CH 1/10W 0	
R2502	ERJ6GMYJ102	M.RESISTOR CH 1/10W 1K	
R2503	ERJ6GMYJ103	M.RESISTOR CH 1/10W 10K	
R2504	ERJ6GMYJ103	M.RESISTOR CH 1/10W 10K	
R2505	ERJ6GMYJ392	M.RESISTOR CH 1/10W 3.9K	
R2506	ERJ6GMYJ105	M.RESISTOR CH 1/10W 1M	
R2507	ERJ6GMYJ274	M.RESISTOR CH 1/10W 270	
R2508	ERJ6GMYG433	M.RESISTOR CH 1/10W 43K	
R2509	ERDS2TJ331	C.RESISTOR 1/4W 330	
R2510	ERDS2TJ330	C.RESISTOR 1/4W 33	
R2511	ERDS2TJ330	C.RESISTOR 1/4W 33	
R2512	ERJ6GMYJ102	M.RESISTOR CH 1/10W 1K	
R2513	ERDS1TJ1R5	C.RESISTOR 1/2W 1.5	
R2514	ERDS1TJ1R2	C.RESISTOR 1/2W 1.2	
R2515	ERDS2TJ330	C.RESISTOR 1/4W 33	
R3002	ERJ6GMYJ183	M.RESISTOR CH 1/10W 18K	
R3006	ERJ6GMYJ271	M.RESISTOR CH 1/10W 270	
R3007	ERJ6GMYG331	M.RESISTOR CH 1/10W 330	
R3012	ERJ6GMYJ472	M.RESISTOR CH 1/10W 4.7K	
R3015	ERJ6GMYJ101	M.RESISTOR CH 1/10W 100	
R3016	ERJ6GMYJ101	M.RESISTOR CH 1/10W 100	
R3017	ERJ6GMYJ122	M.RESISTOR CH 1/10W 1.2K	
R3018	ERJ6GMYJ101	M.RESISTOR CH 1/10W 100	

Ref. No.	Part No.	Part Name & Description	Remarks
R3019	ERJ6GMYJ473	M.RESISTOR CH 1/10W 47K	
R3022	ERJ6GMYJ684	M.RESISTOR CH 1/10W 680K	
R3023	ERJ6GMYJ224	M.RESISTOR CH 1/10W 220K	
R3025	ERJ6GMZ0R00	M.RESISTOR CH 1/10W 0	
R3026	ERJ6GMYJ392	M.RESISTOR CH 1/10W 3.9K	
R3027	ERJ6GMYG271	M.RESISTOR CH 1/10W 270	
R3028	ERJ6GMYG102	M.RESISTOR CH 1/10W 1K	
R3029	ERJ6GMYG152	M.RESISTOR CH 1/10W 1.5K	
R3030	ERJ6GMYG331	M.RESISTOR CH 1/10W 330	
R3031	ERJ6GMYJ392	M.RESISTOR CH 1/10W 3.9K	
R3032	ERJ6GMYJ392	M.RESISTOR CH 1/10W 3.9K	
R3033	ERJ6GMYG152	M.RESISTOR CH 1/10W 1.5K	
R3034	ERJ6GMYK225	M.RESISTOR CH 1/10W 2.2M	
R3501	ERJ6GMYJ101	M.RESISTOR CH 1/10W 100	
R3503	ERJ6GMYG681	M.RESISTOR CH 1/10W 680	NV-SJ220B-S/BL-S
R3503	ERJ6GMYG182	M.RESISTOR CH 1/10W 1.8K	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
R3504	ERJ6GMZ0R00	M.RESISTOR CH 1/10W 0	
R3506	ER0S2CKG3300	M.RESISTOR 1/4W 330	
R4001	ERJ6GMYJ102	M.RESISTOR CH 1/10W 1K	NV-SJ220B-S/BL-S
R4002	ERJ6GMYJ334	M.RESISTOR CH 1/10W 330K	
R4003	ERJ6GMYJ103	M.RESISTOR CH 1/10W 10K	
R4004	ERJ6GMYG241	M.RESISTOR CH 1/10W 240	
R4005	ERJ6GMYJ223	M.RESISTOR CH 1/10W 22K	
R4006	ERJ6GMYJ753	M.RESISTOR CH 1/10W 75K	NV-SJ220B-S/BL-S
R4007	ERJ6GMYJ153	M.RESISTOR CH 1/10W 15K	
R4008	ERJ6GMYJ224	M.RESISTOR CH 1/10W 220K	
R4009	ERJ6GMYJ222	M.RESISTOR CH 1/10W 2.2K	
R4010	ERJ6GMYJ222	M.RESISTOR CH 1/10W 2.2K	
R4011	ERJ6GMYJ471	M.RESISTOR CH 1/10W 470	NV-SJ220B-S/BL-S
R4013	ERJ6GMYJ103	M.RESISTOR CH 1/10W 10K	
R4014	ERJ6GMYJ181	M.RESISTOR CH 1/10W 180	
R4015	ERJ6GMYJ391	M.RESISTOR CH 1/10W 390	NV-SJ220B-S/BL-S
R4016	ERJ6GMYK225	M.RESISTOR CH 1/10W 2.2M	
R4017	ERJ6GMYJ101	M.RESISTOR CH 1/10W 100	
R4018	ERJ6GMYJ183	M.RESISTOR CH 1/10W 18K	
R4019	ERJ6GMYJ333	M.RESISTOR CH 1/10W 33K	
R4020	ERJ6GMYJ182	M.RESISTOR CH 1/10W 1.8K	NV-SJ220B-S/BL-S
R4020	ERJ6GMYJ391	M.RESISTOR CH 1/10W 390	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
R4021	ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	NV-SJ220B-S/BL-S
R4021	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
R4022	ERJ6GMYJ561	M.RESISTOR CH 1/10W 560	
R4026	ERJ6GMYJ472	M.RESISTOR CH 1/10W 4.7K	
R4027	ERJ6GMYJ332	M.RESISTOR CH 1/10W 3.3K	
R4028	ERJ6GMYJ272	M.RESISTOR CH 1/10W 2.7K	
R4029	ERJ6GMYJ332	M.RESISTOR CH 1/10W 3.3K	
R4030	ERJ6GMYJ822	M.RESISTOR CH 1/10W 8.2K	
R4527	ERJ6GMYJ473	M.RESISTOR CH 1/10W 47K	
R4901	ERDS2TJ471	C.RESISTOR 1/4W 470	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
R4902	ERDS2TJ471	C.RESISTOR 1/4W 470	
R4903	ERJ6GMYJ472	M.RESISTOR CH 1/10W 4.7K	NV-SJ220B-S/BL-S
R4904	ERJ6GMYJ153	M.RESISTOR CH 1/10W 15K	

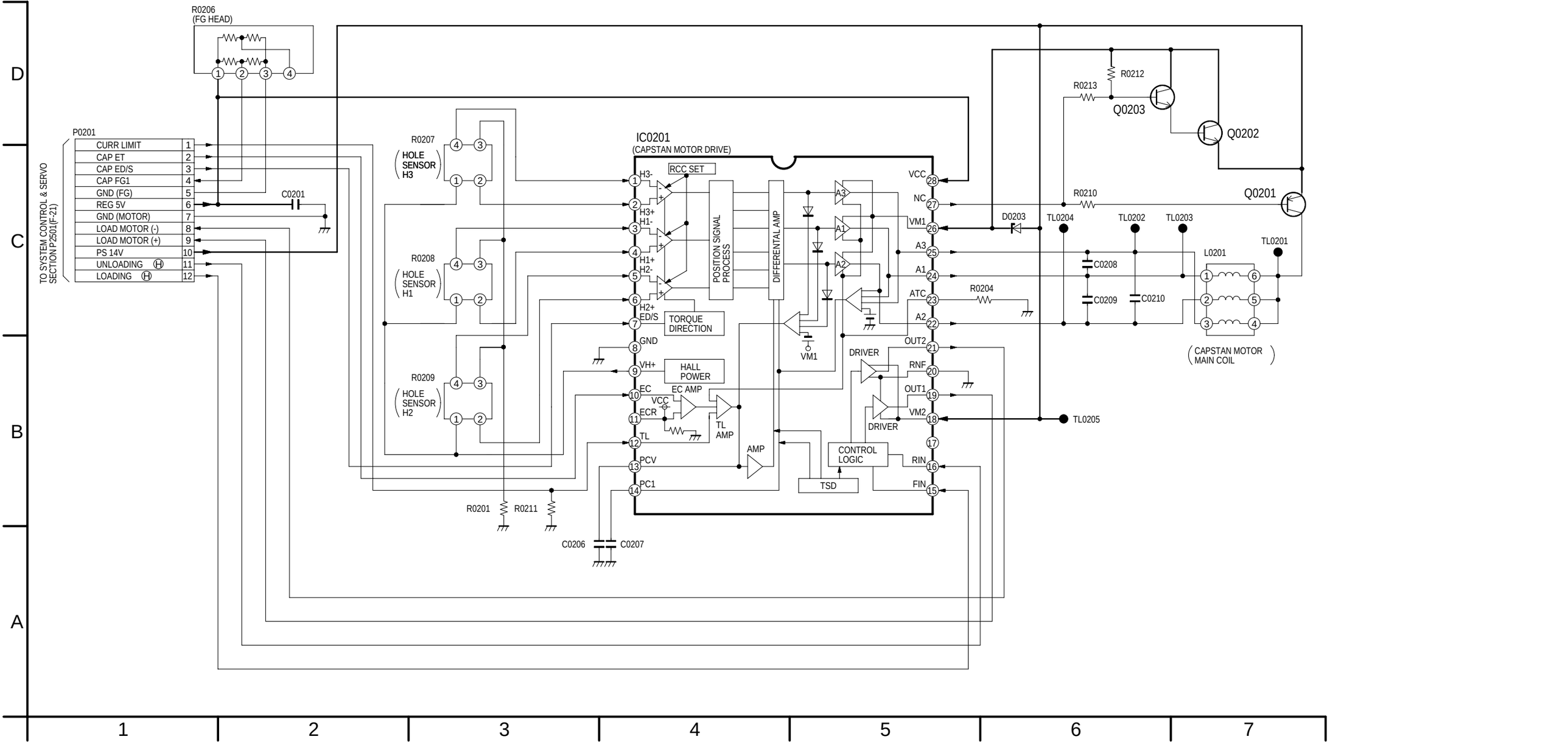
R4504	ERJ6GEYJ153	M.RESISTOR CHIP 1/10W 15K	

Ref. No.	Part No.	Part Name & Description	Remarks
R4905	ERJ6GMYJ223	M.RESISTOR CH 1/10W 22K	NV-SJ220B-S/BL-S
R4906	ERJ6GMYJ562	M.RESISTOR CH 1/10W 5.6K	NV-SJ220B-S/BL-S
R4907	ERJ6GMYJ562	M.RESISTOR CH 1/10W 5.6K	NV-SJ220B-S/BL-S
R4908	ERJ6GMYJ750	M.RESISTOR CH 1/10W 75	NV-SJ220B-S/BL-S
R4909	ERJ6GMYJ223	M.RESISTOR CH 1/10W 22K	
R4910	ERJ6GMYJ474	M.RESISTOR CH 1/10W 470K	
R4911	ERJ6GMYJ750	M.RESISTOR CH 1/10W 75	NV-SJ220B-S/BL-S
R4913	ERJ6GMYJ750	M.RESISTOR CH 1/10W 75	
R4914	ERJ6GMYJ750	M.RESISTOR CH 1/10W 75	
R4915	ERDS2TJ471	C.RESISTOR 1/4W 470	NV-SJ220B-S/BL-S
R4916	ERJ6GMYJ562	M.RESISTOR CH 1/10W 5.6K	NV-SJ220B-S/BL-S
R4916	ERJ6GMYJ103	M.RESISTOR CH 1/10W 10K	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
R4917	ERJ6GMYJ101	M.RESISTOR CH 1/10W 100	NV-SJ220B-S/BL-S
R4919	ERJ6GMYJ562	M.RESISTOR CH 1/10W 5.6K	NV-SJ220B-S/BL-S
R4919	ERJ6GMYJ103	M.RESISTOR CH 1/10W 10K	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
R4921	ERJ6GMYJ101	M.RESISTOR CH 1/10W 100	NV-SJ220B-S/BL-S
R4922	ERJ6GMYJ154	M.RESISTOR CH 1/10W 150K	NV-SJ220B-S/BL-S
R4923	ERJ6GMYJ154	M.RESISTOR CH 1/10W 150K	NV-SJ220B-S/BL-S
R4924	ERJ6GMYJ101	M.RESISTOR CH 1/10W 100	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
R4925	ERJ6GMYJ102	M.RESISTOR CH 1/10W 1K	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
R4926	ERJ6GMYJ471	M.RESISTOR CH 1/10W 470	NV-SJ220B-S/BL-S
R4927	ERJ6GMYJ102	M.RESISTOR CH 1/10W 1K	NV-SJ220B-S/BL-S
R4928	ERJ6GMYJ102	M.RESISTOR CH 1/10W 1K	NV-SJ220B-S/BL-S
R4928	ERJ6GMZ0R00	M.RESISTOR CH 1/10W 0	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
R4938	ERJ6GMYJ221	M.RESISTOR CH 1/10W 220	NV-SJ220B-S/BL-S
R4941	ERJ6GMYJ103	M.RESISTOR CH 1/10W 10K	NV-SJ220B-S/BL-S
R4942	ERJ6GMZ0R00	M.RESISTOR CH 1/10W 0	NV-SJ220B-S/BL-S
R4945	ERJ6GMYJ153	M.RESISTOR CH 1/10W 15K	
R4946	ERJ6GMYJ223	M.RESISTOR CH 1/10W 22K	
R6001	ERJ6GMYJ562	M.RESISTOR CH 1/10W 5.6K	
R6002	ERJ6GMYJ102	M.RESISTOR CH 1/10W 1K	
R6003	ERJ6GMYJ183	M.RESISTOR CH 1/10W 18K	
R6004	ERJ6GMYJ224	M.RESISTOR CH 1/10W 220K	
R6005	ERJ6GMZ0R00	M.RESISTOR CH 1/10W 0	
R6008	ERJ6GMYJ473	M.RESISTOR CH 1/10W 47K	
R6009	ERJ6GMYJ223	M.RESISTOR CH 1/10W 22K	
R6011	ERJ6GMYJ221	M.RESISTOR CH 1/10W 220	
R6012	ERJ6GMYJ221	M.RESISTOR CH 1/10W 220	
R6013	ERJ6GMYJ221	M.RESISTOR CH 1/10W 220	
R6014	ERJ6GMYJ471	M.RESISTOR CH 1/10W 470	
R6015	ERJ6GMYJ471	M.RESISTOR CH 1/10W 470	
R6016	ERJ6GMYJ102	M.RESISTOR CH 1/10W 1K	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
R6017	ERJ6GMYJ102	M.RESISTOR CH 1/10W 1K	
R6018	ERJ6GMYJ102	M.RESISTOR CH 1/10W 1K	
R6019	ERJ6GMYJ103	M.RESISTOR CH 1/10W 10K	
R6020	ERJ6GMYJ393	M.RESISTOR CH 1/10W 39K	
R6021	ERJ6GMYJ273	M.RESISTOR CH 1/10W 27K	
R6022	ERJ6GMYJ101	M.RESISTOR CH 1/10W 100	
R6023	ERJ6GMYJ273	M.RESISTOR CH 1/10W 27K	

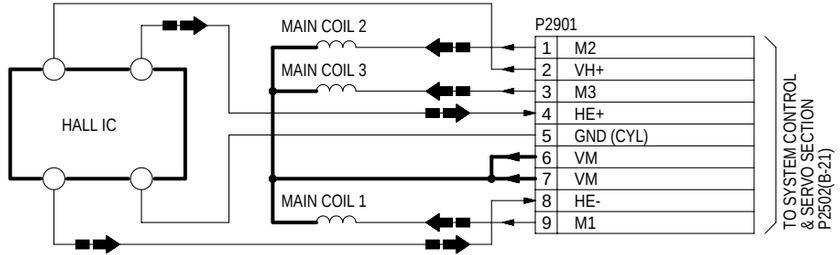
Ref. No.	Part No.	Part Name & Description	Remarks
R6025	ERJ6GMYJ433	M.RESISTOR CH 1/10W 43K	
R6026	ERJ6GMYJ393	M.RESISTOR CH 1/10W 39K	
R6029	ERJ6GMYJ472	M.RESISTOR CH 1/10W 4.7K	
R6030	ERJ6GMYJ472	M.RESISTOR CH 1/10W 4.7K	
R6031	ERJ6GMYJ682	M.RESISTOR CH 1/10W 6.8K	
R7501	ERJ6GMYJ822	M.RESISTOR CH 1/10W 8.2K	
R7502	ERJ6GMYJ562	M.RESISTOR CH 1/10W 5.6K	
R7503	ERJ6GMYJ432	M.RESISTOR CH 1/10W 4.3K	
R7504	ERJ6GMYJ822	M.RESISTOR CH 1/10W 8.2K	
R7505	ERJ6GMYJ562	M.RESISTOR CH 1/10W 5.6K	
R7506	ERJ6GMYJ432	M.RESISTOR CH 1/10W 4.3K	
R7508	ERDS2TJ150	C.RESISTOR 1/4W 15	
R7509	ERJ6GMYJ750	M.RESISTOR CH 1/10W 75	
R7510	ERDS2TJ821	C.RESISTOR 1/4W 820	
R7511	ERDS2TJ821	C.RESISTOR 1/4W 820	
R7513	ERJ6GMYJ303	M.RESISTOR CH 1/10W 30K	
R7514	ERJ6GMYJ303	M.RESISTOR CH 1/10W 30K	
R7515	ERJ6GMYJ303	M.RESISTOR CH 1/10W 30K	
R7516	ERJ6GMYJ303	M.RESISTOR CH 1/10W 30K	
R7517	ERJ6GMYJ103	M.RESISTOR CH 1/10W 10K	
R7518	ERJ6GMYJ103	M.RESISTOR CH 1/10W 10K	
R7519	ERJ6GMYJ432	M.RESISTOR CH 1/10W 4.3K	
R7521	ERJ6GMYJ223	M.RESISTOR CH 1/10W 22K	
R7533	ERJ6GMYJ223	M.RESISTOR CH 1/10W 22K	
R7534	ERJ6GMYJ181	M.RESISTOR CH 1/10W 180	
R7535	ERJ6GMYJ103	M.RESISTOR CH 1/10W 10K	
R7537	ERJ6GMYJ123	M.RESISTOR CH 1/10W 12K	
R7538	ERJ6GMYJ123	M.RESISTOR CH 1/10W 12K	
R7601	ERJ6GMYJ102	M.RESISTOR CH 1/10W 1K	
R7602	ERJ6GMYJ471	M.RESISTOR CH 1/10W 470	
R7604	ERJ6GMYJ101	M.RESISTOR CH 1/10W 100	
R7605	ERJ6GMYJ101	M.RESISTOR CH 1/10W 100	
R7606	ERDS2TJ331	C.RESISTOR 1/4W 330	
R7607	ERDS2TJ331	C.RESISTOR 1/4W 330	
R7608	ERJ6GEYJ151	M.RESISTOR CH 1/10W 150	
R7610	ERJ6GMYJ471	M.RESISTOR CH 1/10W 470	
R7611	ERJ6GMYJ471	M.RESISTOR CH 1/10W 470	
R7613	ERJ6GMYJ151	M.RESISTOR CH 1/10W 150	
R7615	ERJ6GMZ0R00	M.RESISTOR CH 1/10W 0	
R7701	ERJ6GMYJ102	M.RESISTOR CH 1/10W 1K	
R7702	ERJ6GMYJ102	M.RESISTOR CH 1/10W 1K	
R7703	ERJ6GMYJ222	M.RESISTOR CH 1/10W 2.2K	
R7704	ERJ6GMYJ222	M.RESISTOR CH 1/10W 2.2K	
R7705	ERJ6GMYJ564	M.RESISTOR CH 1/10W 560K	
R7706	ERJ6GMYJ104	M.RESISTOR CH 1/10W 100K	
R7707	ERJ6GMYK125	M.RESISTOR CH 1/10W 1.2M	
R7708	ERJ6GMYK125	M.RESISTOR CH 1/10W 1.2M	
R7709	ERJ6GMYJ682	M.RESISTOR CH 1/10W 6.8K	
R7710	ERJ6GMYJ682	M.RESISTOR CH 1/10W 6.8K	
R7711	ERJ6GMYJ221	M.RESISTOR CH 1/10W 220	
R7712	ERJ6GMYJ472	M.RESISTOR CH 1/10W 4.7K	
R7713	ERJ6GMYJ472	M.RESISTOR CH 1/10W 4.7K	
R7714	ERJ6GMYJ472	M.RESISTOR CH 1/10W 4.7K	
R7715	ERJ6GMYJ221	M.RESISTOR CH 1/10W 220	

Ref. No.	Part No.	Part Name & Description	Remarks
R7724	ERJ6GMYJ221	M.RESISTOR CH 1/10W 220	
R7725	ERJ6GMYJ221	M.RESISTOR CH 1/10W 220	
R7726	ERJ6GMYJ152	M.RESISTOR CH 1/10W 1.5K	NV-SJ220B-S/BL-S
R7726	ERJ6GMYJ102	M.RESISTOR CH 1/10W 1K	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
R7728	ERJ6GMYJ473	M.RESISTOR CH 1/10W 47K	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
R7729	ERJ6GMYJ102	M.RESISTOR CH 1/10W 1K	
R7730	ERJ6GMYJ102	M.RESISTOR CH 1/10W 1K	
R7731	ERJ6GMYJ102	M.RESISTOR CH 1/10W 1K	
R7732	ECUM1H100DCN	C.CAPACITOR CH 50V 10P	
R7733	ERJ6GMYJ101	M.RESISTOR CH 1/10W 100	
S1501	K0G934A00002	SWITCH	[SUPPLIED FROM MBV]
S7501	EVQ11G07K	SWITCH	
S7502	EVQ11G07K	SWITCH	
S7503	EVQ11404M	SWITCH	
S7504	EVQ11404M	SWITCH	
S7505	EVQ11L07B	SWITCH	
S7506	EVQPC005B	SWITCH	[SUPPLIED FROM MBV]
S7507	VES0834	S-TAB SWITCH	K0J1BB000004
S7508	EVQ11G07K	SWITCH	
S7511	EVQ11L07B	SWITCH	
S7512	EVQ11G07K	SWITCH	
S7513	EVQ11L07B	SWITCH	
S7514	EVQ11G07K	SWITCH	
S7515	EVQ11L07B	SWITCH	
T0701	EQV5EC083P	TRANSFORMER	NV-SJ220B-S/BL-S
T0701	EQV5EC082P	TRANSFORMER	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
T1101	ETE28K131AZ	SWITCHING TRANSFORMER	⚠
T4002	EQQ7QF024P	TRANSFORMER	
TU7601	ENG47317G1	TUNER	⚠ [SUPPLIED FROM MBV]NV-SJ220B-S
TU7601	ENG47318G1	TUNER	⚠ [SUPPLIED FROM MBV]NV-SJ220BL-S
TU7601	ENG47316G1	TUNER	⚠ [SUPPLIED FROM MBV]NV-SJ220EG-K/EG-S/EGNK/EGMK/EGYS
VR0701	EVNCBAA00B14	V.RESISTOR	
X0701	VLF1417	FILTER	NV-SJ220B-S/BL-S J0B4155A0003
X0701	VLF1416	FILTER	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS J0B4045A0002
X0704	VLF1495	FILTER	NV-SJ220B-S/BL-S
X0704	VLF1493	FILTER	NV-SJ220EG-K/EG-S/EGNK/EGMK/ EGYS
X3001	VSX0162	CRYSTAL OSCILLATOR	
X6001	VSX0660	CRYSTAL OSCILLATOR	
X6002	H0D200500014	CRYSTAL OSCILLATOR	[SUPPLIED FROM MBV]
		MISCELLANEOUS	
	TP00351-51	FUSE HOLDER	

Ref. No.	Part No.	Part Name & Description	Remarks
	TP00351-51	FUSE HOLDER	
	VSC4999	HA CASE (A)	
	VSC4998	HA ANGLE	
	VMP5897	CONNECTING ANGLE	FOR TV DEMODULATOR C.B.A.
■	----------	CYLINDER STATOR C.B.A.	
		MISCELLANEOUS	
	HW-300A-DF	HALL IC	B4AAB0000007
	VJS3537B009G	CONNECTOR (FEMALE) 9P	


R0206
(FG HEAD)
P0201
CURR LIMIT 1
CAP ET 2
CAP ED/S 3
CAP FG1 4
GND (FG) 5
REG 5V 6
GND (MOTOR) 7
LOAD MOTOR (-) 8
LOAD MOTOR (+) 9
PS 14V 10
UNLOADING Ⓗ 11
LOADING Ⓗ 12
TO SYSTEM CONTROL & SERVO SECTION P2501(F-21)
C0201
R0207
HOLE SENSOR H3
R0208
HOLE SENSOR H1
R0209
HOLE SENSOR H2
IC0201
(CAPSTAN MOTOR DRIVE)
RCC SET
POSITION SIGNAL PROCESS
DIFFERENTIAL AMP
TORQUE DIRECTION
HALL POWER
EC AMP
TL AMP
AMP
CONTROL LOGIC
TSD
DRIVER
H3-
H3+
H1-
H1+
H2-
H2+ ED/S
GND
VH+
EC
ECR
TL
PCV
PC1
VCC
NC
VM1
A3
A1
A2
ATC
OUT2
RNF
OUT1
VM2
RIN
FIN
R0201
R0211
C0206
C0207
R0204
R0212
R0213
Q0203
Q0202
Q0201
R0210
D0203
TL0204
TL0202
TL0203
TL0201
L0201
C0208
C0209
C0210
CAPSTAN MOTOR MAIN COIL
TL0205

CYLINDER SERVO SPEED LOOP



NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

A

1 2 3

VIDEO MAIN SIGNAL PATH IN REC MODE
VIDEO MAIN SIGNAL PATH IN PLAYBACK MODE
AUDIO MAIN SIGNAL PATH IN REC MODE
AUDIO MAIN SIGNAL PATH IN PLAYBACK MODE

Ⓡ :TO POWER SUPPLY/RF SECTION
Ⓢ :TO SYSTEM CONTROL & SERVO SECTION
Ⓥ :TO LUMINANCE & CHROMINANCE/AUDIO SECTION

IC4901
LA73020M

Q4901 2SD601A (AV1 PB Ⓗ :ON)
Q4904 2SB709A (AMP)
Q4903 2SD601A (RGB ON:ON)
QR4903 UN2212 (RGB OFF Ⓗ :ON)
QR4905 UN2215 (PROG Ⓗ :ON)
QR4904 UN2215 (PROG Ⓗ :ON)

JK4903 K1FB121B0003 (AV1)

TV	
1	AUDIO OUT
2	AUDIO IN
3	AUDIO OUT
4	GND (A)
5	GND
6	AUDIO IN
7	BLUE
8	PB +12V
9	GND
10	IIC CLOCK
11	GREEN
12	IIC DATA
13	GND
14	GND
15	RED
16	BLANKING
17	GND
18	GND
19	VIDEO OUT
20	VIDEO IN
21	GND

JK4902 K1FB121B0003 (AV2)

DECODER/EXT	
1	AUDIO OUT
2	AUDIO IN
3	AUDIO OUT
4	GND (A)
5	GND
6	AUDIO IN
7	BLUE
8	PB +12V
9	GND
10	IIC CLOCK
11	GREEN
12	IIC DATA
13	GND
14	GND
15	RED
16	BLANKING
17	GND
18	GND
19	VIDEO OUT
20	VIDEO IN
21	GND

NOTE:THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS ( ) ON THIS DIAGRAM IS RECORD MODE WITH PAL COLOUR.(SP MODE)

THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH PAL COLOUR SIGNAL.(SP MODE)

NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

CAUTION

THE STRIPED FRAME INDICATES THE PRIMARY CIRCUIT TO DISTINGUISH THE PRIMARY FROM THE SECONDARY CIRCUIT.

PAY ATTENTION NOT TO RECEIVE AN ELECTRIC SHOCK DURING REPAIR AND SERVICE OF THE PRODUCTS.

Ⓡ :TO POWER SUPPLY/RF SECTION

Ⓣ :TO TIMER SECTION

HOT

P1101 VJS3306 AC INLET

F1101 VSF0243C16

L1107 ELF15N005A

L1108 ELF15N003A

LB1102 0

C1101 1000P

C1118 0.068

D1102 S1WBA80-4062

LB1103 0

C1120 400V 33

LB1101 0

LB1104 0

C1104 1000P

R1110 12K

R1108 12K

R1104 12K

R1103 12K

R1117 12K

R1126 12K

R1105 1M

R1106 1M

D1118 22K

R1102 22K

C1109 0.01

D1103 AP01CV2

T1101 ETE28K131AZ

P1

P2

V1

V2

S7

S8

S3

S4

S6

S1

S2

S5

D1125 11EQS06

IP1101 VSF0015A10T

C1143 10V330

HEATER (+)

HEATER (-)

C1136 100P

D1114 21DQ06FC4

L1122 22u

C1134 10V1200

C1135 10V330

UNREG 5.6V

D1124 ERA22-04

L1124 100u

C1142 220P

C1140 50V100

C1141 0.01

UNREG -29V

LB1107 0

C1107 1000P

D1104 MA185

R1115 47

D1121 RL2ZPLF-C4

L1121 22u

C1131 25V820

C1132 25V330

UNREG 16V

C1139 220P

D1123 ERA22-04

L1123 100u

C1137 50V47

C1138 0.01

UNREG 36V

GND

Q1102 2SB1030A (PROTECTOR)

Q1101 2SD1996 (PROTECTOR)

R1123 2200

R1124 22K

C1122 120P

D1105 MA165

R1118 100

R1107 100K

C1111 1000P

C1110 10V330

IC1101 STRG6352LF

OVP

TSD

TRI

UVLO

REG

INTERNAL BIAS

DELAY

LATCH

DRIVE

PWM LATCH

OCP

OSC

R1109 1500

C1114 50V47

D1130 MA7300B

C1108 68P

D1107 MA165

C1112 8200P

R1114 2200

Q1111 PC123ZY2

R1125 100

R1101 2700

LB1105 VLP0056

R1111 470

R1113 0.68

D1106 MA165

R1112 1K

C1106 1000P

IC1102 uPC1093J

C1102 0.01

R1116 1K

R1119 27K

R1121 2700

R1120 2200

NOTE:THE MEASURMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE.

NOTE1:WHEN MEASURE THE VOLTAGE OR WAVEFORM ON THE POWER TRANSFORMER CIRCUIT,SET THE GND TERMINAL OF MEASURING POINT AS FOLLOWS.
PRIMARY SIDE..... ⏚
SECONDARY SIDE... ⏚

NOTE2:THE DC VOLTAGE INDICATED IN PRIMARY SIDE IS SHOWN THE VOLTAGE WHEN INPUT AC IS 240V.

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS,USE ONLY THE SAME TYPE.

NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

VIDEO MAIN SIGNAL PATH IN REC MODE
VIDEO MAIN SIGNAL PATH IN PLAYBACK MODE
AUDIO MAIN SIGNAL PATH IN REC MODE
AUDIO MAIN SIGNAL PATH IN PLAYBACK MODE

Ⓟ :TO POWER TRANSFORMER SECTION
Ⓢ :TO SYSTEM CONTROL & SERVO SECTION
Ⓥ :TO LUMINANCE & CHROMINANCE/AUDIO SECTION
Ⓘ :TO INPUT/OUTPUT SECTION
Ⓣ :TO TIMER SECTION

Q1002 2SD602A (BUFFER)
Q1006 2SD601A (FIP ON/OFF CONTROL)
QR1001 UN2112 (FIP Ⓛ:ON)
Q1008 2SB710A (POWER SAVE:OFF)
Q1007 2SD1996 (12V REG.)
Q1202 2SD1996 (5V REG.)
Q1201 2SD1996 (5V REG.)
Q1003 2SD1996 (5V REG.)
Q1004 2SD1996 (5V REG.)
Q1005 2SD602A (5V REG.)
QR1002 UN2211 (SLEEP Ⓗ :OFF)
QR1201 UN2212 (POWER OFF Ⓗ :ON)
Q7601 2SB709A (AMP)
QR7602 UN2113 (BUFFER)
QR7601 UN2215 (MUTE)

TU7601
TUNER UNIT
ENG47316G1:A/B
ENG47317G1:C
ENG47318G1:D

1 N.SW 5V
2 GND
3 DATA
4 CLOCK
5 PS 5V
6 VIDEO OUT
7 AUDIO OUT
8
9 BT
10
11 CLOCK
12 DATA
13
14 TUNER 5V
15 SW1
16 BTL 30V
17 IF OUT
18 IF IN

DU7601

19	———	PK0701-1
20	———	PK0701-2
21	TUNER AUDIO	PK0701-3
22	———	PK0701-4
23	AFC S-CURVE	PK0701-5
24	TUNER VIDEO	PK0701-6
25	TUNER 5V	PK0701-7
26	———	PK0701-8
27	GND	PK0701-9

TO TV DEMODULATOR PACK PK0701(D-1)

IP1002 UNH001200A
IP1005 0
IP1003 UNH000300A
IP1004 UNH000300A
IP1001 UNH000300A

D1013 0
D1005 0
D1008 MA4130NL
D1012 0
D1201 MA4051NM
D1202 MA165
D1003 MA4051NH
D1002 MA165
D1006 MA4051NM
D1007 MA165
D7601 MA4300M

L7602 33u
L7601 33u
L7604 33u
LB7602 0
L7605 0
L7603 33u
L7609 10u

C7603 6V100
C7607 220P
C7604 6V100
C7616 6V100
C7617 0.01
C7609 220P
C7611 220P
C7608 220P
C7612 0.1
C7615 33P
C7619 33P
C7614 33P
C7610 50V10
C1011 0.01
C1010 16V47
C1013 16V10
C1206 0.01
C1208 0.1
C1207 6V47
C1205 0.01
C1202 6V100
C1204 10V22
C1003 0.01
C1004 16V47
C1006 0.01
C1002 10V22
C1008 50V47
C1007 16V10

R1004 56K
R1005 56K
R1009 22K
R1008 22K
R1011 5600
R1006 10K
R1007 10K
R1027 10K
R1002 68K
R1003 68K
R1025 4700
R1026 10K
R1023 8200
R1012 1800
R1017 2700
R1204 1K
R7607 330
R7606 330
R7604 100
R7605 100
R7601 1K
R7602 470
R7611 470
R7610 470
R7615 0
R7613 150
R7608 150

P HEATER (-)
P HEATER (+)
T PS HEATER (+)
P UNREG -29V
T FIP -29V
S CYL 14V
P CAP 14V
S FIP Ⓛ
S SLEEP Ⓛ
P UNREG 36V
P UNREG 16V
P UNREG 5.6V
P GND
S GND
V GND
I GND
T GND
I GND (A)
S GND (FG)
S GND (MOTOR)
S GND (CYL)
S POWER OFF Ⓗ
V VIDEO 5V
S REG 5V
I PS 12V
S I PS 5V
V BIAS 5V
S I T N.SW 5V
S AUDIO DEF Ⓗ
S SYS IIC DATA
S SYS IIC CLOCK
I TUNER AUDIO
I V TUNER VIDEO
S AFC S-CURVE
S VIDEO OUT
V AUDIO OUT
A1 A2 A3 A4 A5 A6 A7 A8

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS,USE ONLY THE SAME TYPE.

NOTE:THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE.

NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

G F E D C B A
1 2 3 4 5 6 7 8 9 10

Ⓡ :TO POWER SUPPLY/RF SECTION
Ⓥ :TO LUMINANCE & CHROMINANCE/AUDIO SECTION
Ⓘ :TO INPUT/OUTPUT SECTION
Ⓣ :TO TIMER SECTION

CAPSTAN SERVO SPEED LOOP
CAPSTAN SERVO PHASE LOOP
CYLINDER SERVO SPEED LOOP
CYLINDER SERVO PHASE LOOP

IC6001
M37970VXGD

IC1502
RPI354N
(S-REEL)

IC1501
RPI354N
(T-REEL)

Q1501
PNB2301MBV
(T-PHOTO)

SENSOR
D1501
SIR505S

Q1502
PNB2301MBV
(S-PHOTO)

QR6001
UN2215
(AV1 PB Ⓛ:OFF)

QR6006
UN2211
(SLEEP Ⓛ:OFF)

S1501
K0G934A-00002

TW2002
TW2015
TW6002
TL6010
TL6012
TL6013
TL2502
TL2503

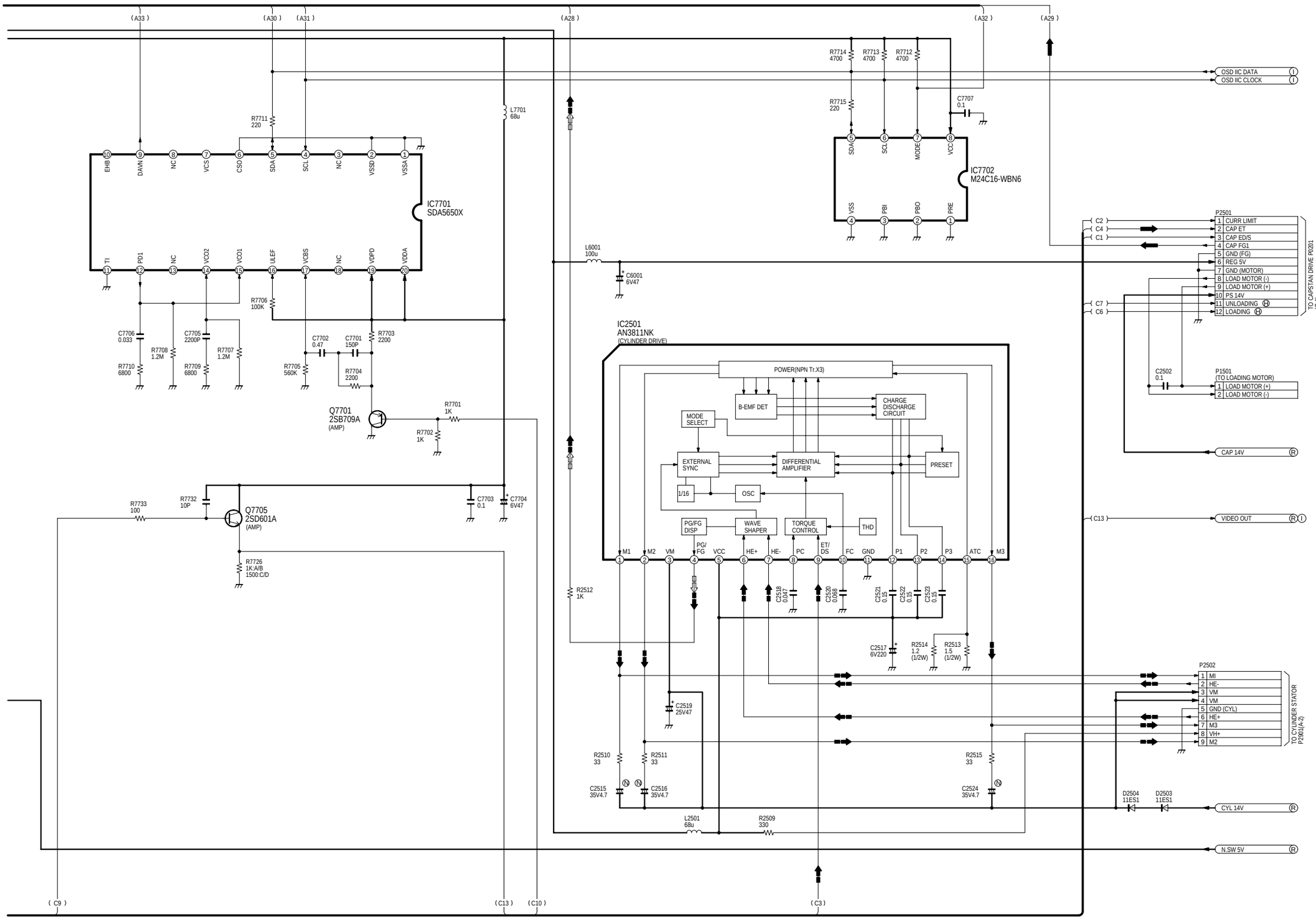
X6002
H0D200-500014
X6001
VSX0660

D6001 0
L7703 68u
R1505 100
R6002 1K
R6003 18K
R6004 220K
R6005 0
R6006 1K
R6008 47K
R6009 22K
R6011 220
R6012 220
R6013 220
R6014 470
R6015 470
R6016 1K
R6017 1K
R6018 1K
R6019 10K
R6020 39K
R6021 27K
R6022 100
R6023 27K
R6025 43K
R6026 39K
R6029 4700
R6030 4700
R6031 6800
R7724 220
R7725 220
R7728 47K
R7729 1K
R7730 1K
R7731 1K
R1501 120
R1502 180
R1503 27K
R1504 27K
R2501 0
R2502 1K
R2503 10K
R2504 10K
R2505 3900
R2506 1M
R2507 270K
R2508 43K
R2509 0.47
R7620 0.1
C2505 0.056
C2506 0.056
C2507 0.056
C2508 0.1
C2510 33P
C2511 6V22
C2512 25V4.7
C2513 3900P
C6001 0.1
C6002 150P
C6003 470P
C6004 0.01
C6005 0.01
C6006 1000P
C6007 1000P
C6008 1000P
C6009 18P
C6010 18P
C6011 18P
C6012 15P
C6013 0.1
C6014 1000P
C6015 16V10
C6016 0.01
C6017 680P
C7711 220P
C7712 1
C7713 6V47
C1502 330P
R6001 5600
R7727 47K

1	CURRENT LIMIT	30	GND(D)
2	F ADJ.	31	20MHz IN
3	NC	32	20MHz OUT
4	C.EMPH Ⓗ	33	+5V(D)
5	TRACKING ENV.	34	32KHz IN
6	SLP Ⓗ	35	32KHz OUT
7	LP Ⓗ	36	VC OUT
8	CPB	37	V.EE Ⓛ
9	AFC S	38	D.REC Ⓗ
10	A.MUTE Ⓗ	39	D.A.REC Ⓗ
11	AV1 PB +12V	40	BIAS Ⓛ
12	N/S/T1/T2	41	FM MUTE Ⓗ
13	S-PHOTO	42	FULL ERASE Ⓗ
14	T-PHOTO	43	POWER KEY
15	ABS NORM Ⓗ	44	POS.WS3
16	CAL Ⓗ	45	POS.WS2
17	REC/PLAY Ⓛ	46	POS.WS1
18	V-SYNC Ⓛ	47	POWER OFF Ⓗ
19	D.FM REC Ⓗ	48	FIP Ⓛ
20	ART V/H/N	49	P50 IN
21	ROTARY SW	50	LC.OSC IN
22	H.AMP SW	51	LC.OSC OUT
23	ENV.SELECT	52	RESET Ⓛ
24	VIDEO H.SW	53	4FC LPF
25	AUDIO H.SW	54	OSD FSC IN
26	A.DEF Ⓗ	55	+5V(OSD)
27	PROG.ON Ⓗ	56	CV IN
28	AVI PB Ⓛ	57	GND(OSD)
29	AVPB Ⓜ	58	LECA

59	20Hz START Ⓗ	87	FLASH DATA IN
60	MDO	86	FLASH CLOCK
61	CV OUT	85	SHORT DET Ⓛ
62	HLF	84	125Hz
63	SECAM VIDEO IN	83	CAP F/R
64	GND	82	HALF WAVE Ⓗ
65	S TAB Ⓛ	81	SAT IR/DIG.LINK
66	UNLOADING Ⓗ	80	CYL ET
67	LOADING Ⓗ	79	CAP ET
68	C SYNC	78	P50 OUT
69	EX.FF/REW Ⓛ	77	IR
70	PAL-I/GB/DK Ⓛ	76	P FAIL Ⓛ
71	SECAM/PAL	75	VBI1
72	SLEEP Ⓛ	74	A.DUB Ⓗ
73	PB 60Hz Ⓗ	88	FLASH DATA OUT
89	FLD/T2 CLK	90	FLD/T2 DATA IN
91	FLD/T2 DATA OUT	92	FLD CS
93	T-REEL PULSE	94	S-REEL PULSE
95	DAVN	96	EEP WR
97	OSD IIC CLK	98	OSD IIC DATA
99	SYS IIC CLK	100	SYS IIC DATA
101	NC	102	NC
103	FG AMP OUT	104	FG AMP IN
105	GND(A)	106	GND
107	PFG	108	O REF
109	I REF	110	GND
111	CTL HEAD(-)	112	CTL HEAD(+)
113	CTL AMP REF	114	PB CTL OUT
115	+5V(A)	116	+5V(ADJ)

T	P.FAIL Ⓛ	A18	
T	IR	A17	
V	SHORT DET Ⓛ	A16	
T	S.CLOCK	A15	
T	S.DATA	A14	
T	FIP CS	A13	
R V	SYS IIC CLOCK	A12	
R V	SYS IIC DATA	A11	
V	CYL HEAD (-)	A10	
V	CYL HEAD (+)	A9	
I	AV1 PB 12V	A7	
I	AV2 PB 12V	A5	
V	LP Ⓗ	A4	
V	PAL EP Ⓗ	A3	
V	FREQ. ADJ.	A1	
V	TRACING ENV.		
R	AFC S-CURVE		
R	PS 5V		
R	REG 5V		
R	GND		
R	GND (FG)		
R	GND (MOTOR)		
R	GND (CYL)		
V	H.AMP SW		
I	AV1 PB Ⓗ		
V	ART V/H/N	B5	
V	ROTARY SW	B6	
V	HEAD SW	B8	
R	AUDIO DEF Ⓗ	B10	
I	PROG.Ⓗ	B11	
V	D.REC Ⓗ	B13	
V	D.A.REC Ⓗ	B14	
V	BIAS Ⓛ	B15	
V	MUTE Ⓗ	B16	
T	POWER SW	B18	
R	POWER OFF Ⓗ	B19	
R	FIP Ⓛ	B20	
T	RESET Ⓛ	B21	
V	FSC	B22	
V	Y/C VIDEO OUT	B23	
T	SAFETY TAB Ⓛ	B24	
R	SLEEP Ⓛ	B25	
I	SLEEP Ⓗ	B26	
V	C SYNC	B27	
T	BACK UP 5V		



NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

Ⓟ :TO POWER TRANSFORMER SECTION
Ⓡ :TO POWER SUPPLY/RF SECTION
Ⓢ :TO SYSTEM CONTROL & SERVO SECTION

DP7501
25U39169TANF

F+ F+ P1 P2 P3 P4 P5 P6 P7 P8 NC P9 P10 P11 P12 P13 P14 P15 P16 P17 P18 NC NC NC NC NC NC NC NC NC NC 1G 2G 3G 4G 5G 6G 7G NC NC F- F-
1 2 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 44 45

Ⓡ PS HEATER (+)
R7508 15
C7501 0.01
Ⓟ HEATER (-)
D7501 MN4220NM
C7502 50V10
R7511 820
R7510 820
Ⓡ FIP -29V
R7509 75

-28.4 -28.3 -29.0 -29.4 -28.3 -28.1 -28.5 -24.3 -29.0 -24.3 -24.1 -24.3 -19.0 -24.3 -24.1 -14.3 -29.4 -29.4
S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14 S15 S16 S17 VEE
36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19

IC7501
M35502AFP

S DATA S CLOCK CS Ⓛ A3 A2 A5 A4 VSS OSC VCC G1 G2 G3 G4 G5 G6 G7 S18
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
4.9 5.0 2.4 5.2 5.2 5.2 5.2 2.3 5.2 -24.8 -24.8 -24.8 -24.8 -24.8 -24.8 -24.8 -29.4

C7503 12P

Ⓢ S.DATA
Ⓢ S.CLOCK
Ⓢ FIP CS
Ⓢ SAFETY TAB Ⓛ
SAFETY TAB
S7507 VES0834
POWER
S7506 EVQPC005B
Ⓢ POWER SW
R7521 22K
Ⓢ IR
Ⓡ N.SW 5V
Ⓡ GND

IC7502
PNA4611M08V
(IR RECEIVER)
R OUT GND VCC
1 2 3
5.2 5.2

R7533 22K
R7517 10K
R7518 10K
R7513 30K
R7515 30K
R7516 30K
R7514 30K

IC7504
S80743AL
(RESET)
RST VDD VSS
1 2 3
5.2 5.2

IC7503
RN5VD28AA
(RESET)
OUT CD VDD GND
1 5 2 3
4.9 4.4 4.9 0

C7504 6V100
C7510 0.01
R7535 10K
C7509 0.068
C7511 0.1
D7503 RB441PT-77
R7534 180
C7507 VCE0073
C7508 6V220
Ⓢ P.FAIL Ⓛ
Ⓢ RESET Ⓛ
Ⓢ BACK UP 5V

CH UP S7504 EVQ11404M
PAUSE S7503 EVQ11404M
PLAY S7511 EVQ11L07B
REW S7512 EVQ11G07K
R7506 4300
R7505 5600
R7504 8200
R7537 12K

CH DOWN S7502 EVQ11G07K
REC S7501 EVQ11G07K
STOP S7515 EVQ11L07B
TIMER REC S7513 EVQ11L07B
FF S7514 EVQ11G07K
R7503 4300
R7502 5600
R7501 8200
R7538 12K

EXT LINK S7508 EVQ11G07K
EJECT S7505 EVQ11L07B
R7519 4300

NOTE:THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE.

NOTE:DO NOT USE PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLESE REFER TO PARTS LIST.

VIDEO SIGNAL PATH

AUDIO SIGNAL PATH

F E D C B A

1 2 3 4 5 6 7 8

R0740 470
R0717 470
C0724 220P:A/B 330P:C/D
C0709 47P
R0737 330:A/B 1K:C/D
R0726 68K
C0706 50V1
R0727 0
L0705 33u
C0705 15P
(A/B)
R0746 560K
C0719 0.1
R0745 3.3M
R0711 180
C0707 50V2.2
T0701 EQV5EC082P:A/B EVQ5EC083P:C/D
C0708 50V 0.47
C0717 33P
R0729 10K
R0730 10K
R0701 100K
(A/B)
(C/D)
R0728 0
(C/D)

3.1 2.4 1.5 3.3 2.7 2.2 3.3 4.3 4.3 1.8 0 1.3

BPF
AMP SW
EQ AMP
TRAP
LPF
VCO
FLL
BPF
AGC
AFT AMP
LIM AMP
VIDEO DET
APC DET
1ST SIF DET
S PLL
FM DET
FIL CONT
VIF AMP
IF AGC
1ST AMP
DEEMPHP
RF AGC

IC0701
LA75503

2.6 2.4 2.2 3.3 2.8 2.8 5.0 1.6 0.1 4.0 2.1

R0742 150
Q0702 2SD601A (AMP)
3.6
3.3
2.6
R0741 220
C0721 120P:A/B 82P:C/D
R0743 1K

PK0701

DU7601-19		1
DU7601-20		2
DU7601-21	TUNER AUDIO	3
DU7601-22		4
DU7601-23	AFC S-CURVE	5
DU7601-24	TUNER VIDEO	6
DU7601-25	TUNER 5V	7
DU7601-26		8
DU7601-27	GND	9

TO POWER SUPPLY / RF SECTION DU7601 (D-10)

0
2.1
2.6
5.0

C0718 16V10
R0739 4700
Q0701 2SD601A (AMP)
5.0
2.6
2.0
R0734 3900
R0733 220
R0723 0
R0724 0
C0722 12K
C0716 0.022
D0702 0
R0705 4700
VR0701 10KB
R0707 39K
C0701 1
R0708 3300
C0702 1000P
C0703 1
C0713 6V330
C0714 1
C0704 0.033
R0719 4700
C0712 0.1
X0704 VLF1493:A/B VLF1495:C/D
L0701 0.18u:A/B 0.22u:C/D
X0701 VLF1416:A/B VLF1417:C/D
C0710 0.01
L0703 2.2u:A/B 1.8u:C/D
R0725 100
C0715 3P:A/B 12P:C/D
C0711 16V22
R0715 22K

PP0701 (TO TUNER UNIT)

4MHz	1
AGC	2
IF	3
GND	4

NOTE:THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE.

NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

Ⓡ :TO POWER SUPPLY/RF SECTION
Ⓢ :TO SYSTEM CONTROL & SERVO SECTION
Ⓘ :TO INPUT/OUTPUT SECTION
Ⓣ :TO TIMER SECTION

VIDEO MAIN SIGNAL PATH IN REC MODE
VIDEO MAIN SIGNAL PATH IN PLAYBACK MODE
AUDIO MAIN SIGNAL PATH IN REC MODE
AUDIO MAIN SIGNAL PATH IN PLAYBACK MODE

P4003
(TO A/C HEAD)
AUDIO ERASE IN 1
GND 2
A.HEAD (R) 3
A.HEAD (W) 4
CTL HEAD (-) 5
CTL HEAD (+) 6

T4002
EQQ7QF024P
R4030 8200
C4032 220P
C4031 0.022
C4029 1500P
R4029 3300
0.3 (-0.6)
0.4 (4.7)
Q4006 2SD602A (OSC)
L4003 68u
C4030 6V220
C4028 0.022
0.4 (4.9)
5.0 (4.1)
Q4005 2SB710 (AUDIO ERASE DRIVE)
R4028 2700
C4026 10V22
R4027 3300
5.0
R4026 4700
C4027 16V10

Ⓢ CTL HEAD (+)
Ⓢ CTL HEAD (-)
Ⓢ SHORT DET Ⓛ
Ⓢ BIAS Ⓛ

P4002
(TO FULL ERASE HEAD)
FULL ERASE OUT 1
FULL ERASE IN 2

Ⓢ HEAD SW (A1)
Ⓢ H.AMP SW (A2)
Ⓢ TRACKING ENV. (A4)
Ⓢ D.REC Ⓗ (A5)
Ⓘ TUNER AUDIO (A7)
Ⓘ Ⓡ AUDIO OUT (A9)
Ⓢ MUTE Ⓗ (A10)
Ⓘ AUDIO IN (A11)

P3502
(TO CYLINDER UNIT)
R 1 (A15)
COM 2 (A16)
L 3 (A17)
4
5 (A19)

R4013 10K
0 (4.9)
QR4003 UN2111 (D.A.REC Ⓗ:OFF)
5.0(-23.0)
5.0
R4009 2200
0.7 (-23.1)
Q4001 2SD601A (PB:ON)
0(3.6)
0 (-14.9)
R4010 2200
0.7 (-23.1)
Q4002 2SD601A (PB:ON)

Ⓢ D.A.REC Ⓗ
Ⓢ PAL EP Ⓗ

Ⓡ BIAS 5V
Ⓡ VIDEO 5V
Ⓡ GND

TW2001
IC3501
AN3365SB
C3002 1000P
C3003 1000P
C3508 0.1
C3509 0.1
LB3503 VLP0147
LB3504 VLP0147
0.7 (2.4)
0 (2.5)
HA2
HA1
L
H

1 HEAD SW 2.4
2 0
3 NC 0
4 NC 0
5 GND
6 NC 0
7 A17 0.7 (2.4)
8 GND
9 A15 0.7 (2.4)
10 A16 0 (2.5)
11 0
12 NC 0
13 NC 0
14 NC 0
15 NC 0
16 NC 0
17 NC 0
18 NC 0

36 VCC 5.0
35 NC 0
34 NC 0
33 NC 0
32 LPF Ⓗ 0
31 ZAP 1.4
30 2.4 (0)
29 GND
28 AT 2.7 (1.9)
27 3.9 (2.2)
26 NC 0
25 REC Ⓗ 0 (4.9)
24 NC 0
23 NC 0
22 NC 0
21 NC 0
20 NC 0
19 NC 0

CHROMA AMP
L3501 33u
C3501 6V47
C3502 0.01
TW3030
C3510 0.1
R3506 330
TW3001
R3501 100
C3511 0.1
R3503 1800: A/B 680: C/D
R3504 0
C3505 0.01
B1
B2
B3
A4
A5

(C/D)
0.2(15.0)
QR4009 UN2215 (PAL EP Ⓗ:ON)
0.3
QR4008 UN2215 (PAL EP Ⓗ:ON)
C4033 100P
R4001 1K
QR4001 UN2212 (PAL EP Ⓗ:ON)
C4001 2200P

QR4005 UN2113 (BUFFER)
-0.4 (-0.1)
R4022 560
QR4004 UN2215 (MUTE)
(C/D)
R4011 470
C4010 0.027
QR4002 UN2211 (PAL EP Ⓗ:ON)
C4009 1

(A7)
(A9) (A10) (A11)

1 2 3 4 5 6 7 8 9 10 11 12

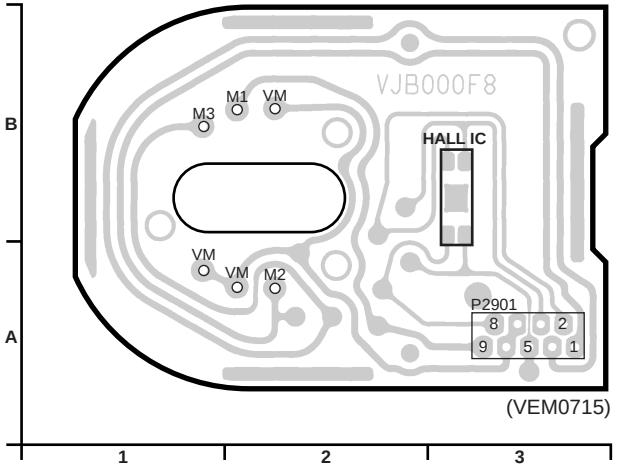
IC3001
AN3531NFBS

NOTE:THE MEASUREMENT MODE OF THE DC VLOLTAGE IN THE BRACKETS( )ON THIS DIAGRAM IS RECORD MODE WITH PAL COLOUR.(SP MODE)

THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH PAL COLOUR SIGNAL.(SP MODE)

NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

12 13 14 15 16 17 18 19 20 21 22 23

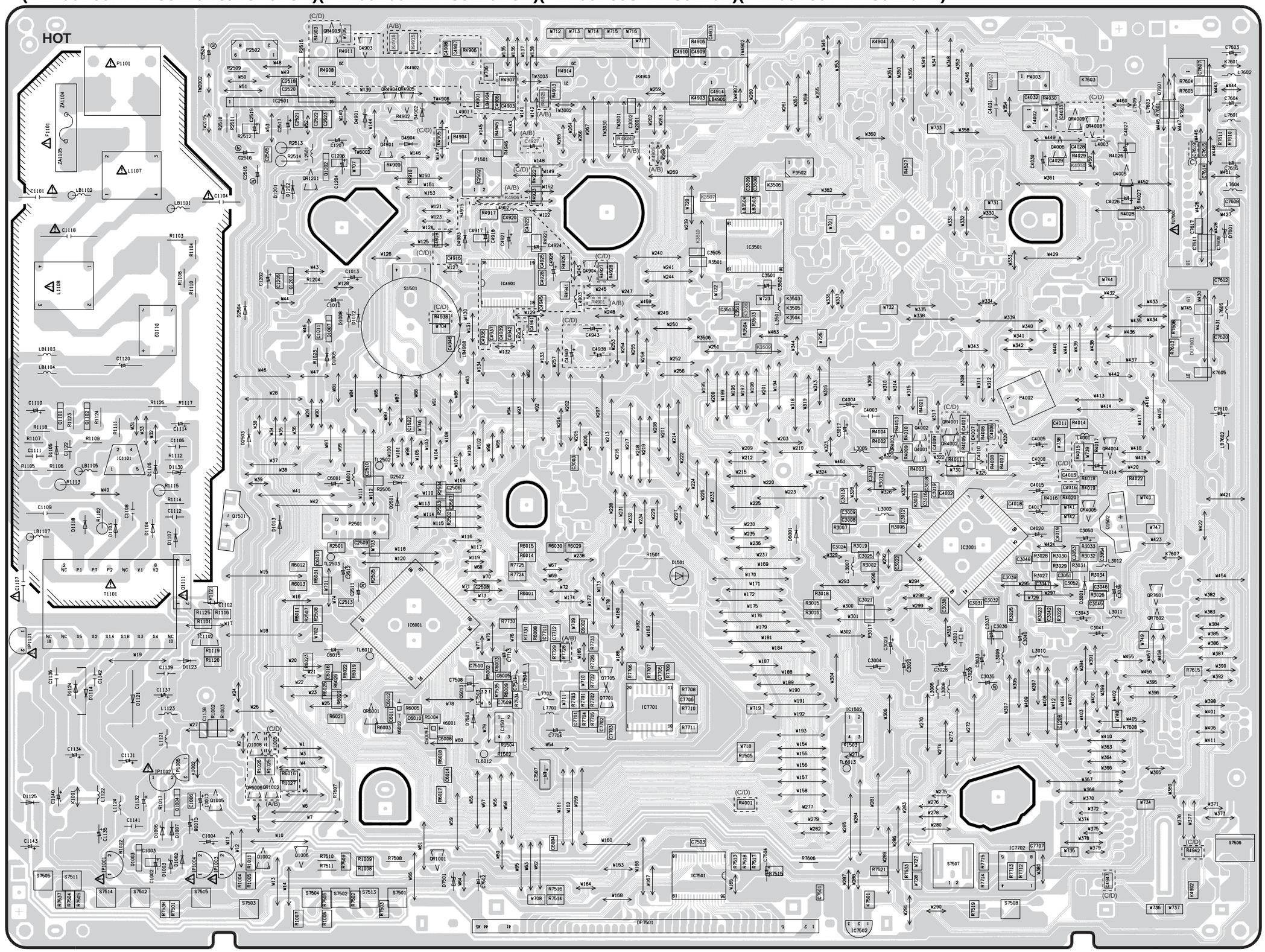


(VEM0715)

CYLINDER STATOR UNIT	
Integrated Circuit	
HALL IC	B-3
Connector	
P2901	A-3

ADDRESS INFORMATION

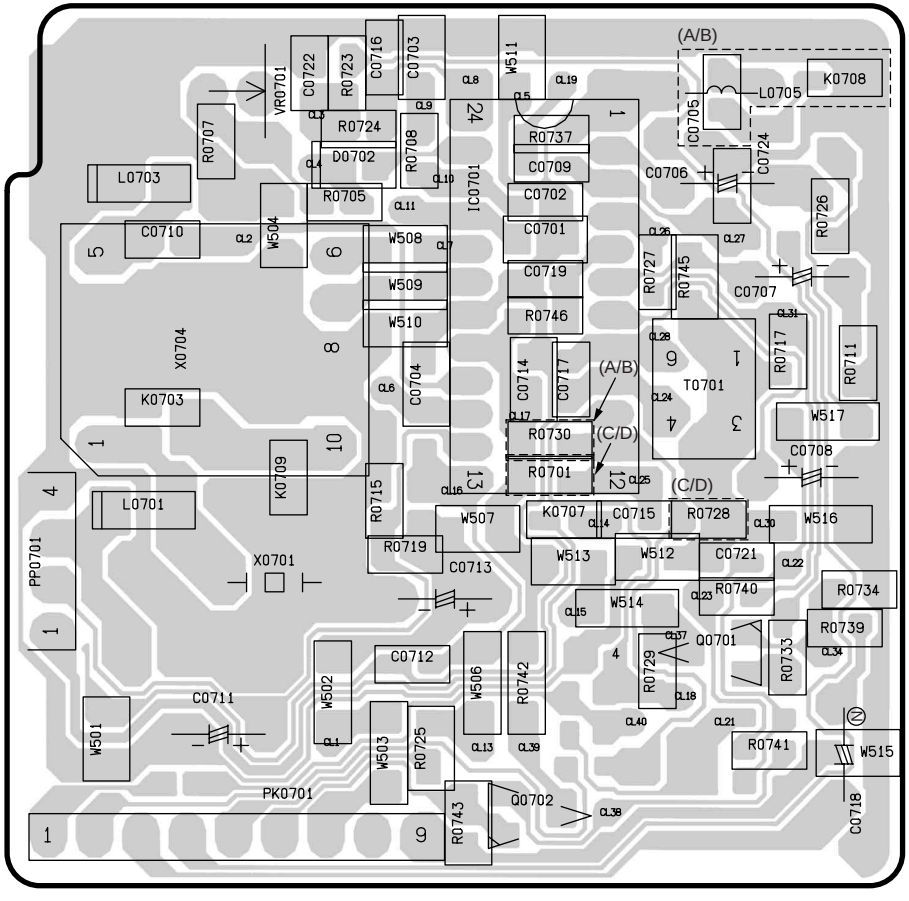
(VEP06D85R:NV-SJ220EG/EGM/EGN)(VEP06E00L:NV-SJ220EGY)(VEP06D85S:NV-SJ220B)(VEP06D85T:NV-SJ220BL)



MAIN C.B.A.			
Transistor		**Integrated Circuit**	
Q1002	A-2	IC1101	D-1
Q1003	A-1	IC1102	C-2
Q1004	B-2	IC1501	B-4
Q1005	B-2	IC1502	B-6
Q1006	A-3	IC2501	F-2
Q1007	E-3	IC3001	C-7
Q1008	B-2	IC3501	E-5
Q1101	D-1	IC4901	E-4
Q1102	D-1	IC6001	C-3
Q1111	C-2	IC7501	A-5
Q1201	E-2	IC7502	A-6
Q1202	F-3	IC7503	B-4
Q1501	C-2	IC7504	B-4
Q1502	C-8	IC7701	B-5
Q4001	D-6	IC7702	A-7
Q4002	D-6	**Test Point**	
Q4005	F-8	TL2502	D-3
Q4006	F-7	TL2503	C-3
Q4901	F-3	TL6010	B-3
Q4903	F-3	TL6012	B-4
Q4904	E-4	TL6013	B-6
Q7601	F-8	TW2001	F-5
Q7701	B-4	TW2002	F-2
Q7705	B-4	TW2015	F-2
Transistor & Resistor		TW3001	F-5
QR1001	A-3	TW3002	F-4
QR1002	B-2	TW3003	F-4
QR1201	E-3	TW3030	F-4
QR4001	D-7	TW4901	F-5
QR4002	D-7	TW4902	F-5
QR4003	D-6	TW4906	F-3
QR4004	D-8	TW4907	F-5
QR4005	C-7	TW6002	F-3
QR4008	F-7	**Connector**	
QR4009	F-7	P1101	F-1
QR4903	F-3	P1501	F-4
QR4904	F-3	P2501	C-3
QR4905	F-3	P2502	F-2
QR6001	B-3	P3502	F-6
QR6006	B-2	P4002	D-7
QR7601	C-8	P4003	F-7
QR7602	C-8	DU7601	D-8
		TU7601	E-8

ADDRESS INFORMATION

(VEP07A23N:NV-SJ220EG/EGM/EGN/EGY)
(VEP07A23P:NV-SJ220B/BL)



TV DEMODULATOR PACK C.B.A.	
Transistor	
Q0701	B-3
Q0702	A-3
Integrated Circuit	
IC0701	C-2
Adjustment	
T0701	B-3
VR0701	D-2
Connector	
PK0701	A-2
PP0701	B-1

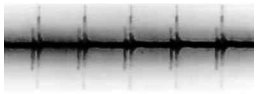
ADDRESS INFORMATION

T1101-3 STOP
9.0Vp-p (2msec. div.)

T1101-7 STOP
100Vp-p (5µsec. div.)

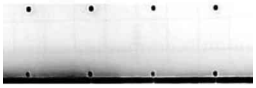
IC1101-1 STOP
470Vp-p (5µsec. div.)

IC1101-2 STOP
8.0Vp-p (10µsec.div.)

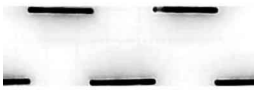


IC1101-4 STOP
0.5Vp-p (10µsec.div.)

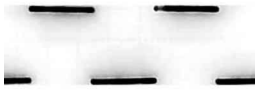
IC1101-5 STOP
0.6Vp-p (10µsec.div.)



IC6001-20 PAUSE
5.0Vp-p (10msec.div.)



IC6001-21 REC
5.0Vp-p (10msec.div.)



IC6001-24 REC
5.0Vp-p (10msec.div.)

IC6001-61 REC
2.4Vp-p (20µsec.div.)

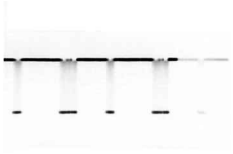
IC6001-68 REC
5.0Vp-p (10msec.div.)

IC6001-89 REC
5.0Vp-p (10msec.div.)

IC6001-90,91 REC
5.0Vp-p (10msec.div.)

IC6001-93,94 FF/REW
5.0Vp-p (1msec.div.)

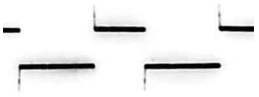
IC6001-97,98 REC
5.0Vp-p (10msec.div.)



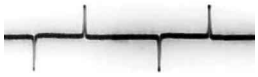
IC6001-99 REC
5.0Vp-p (10msec.div.)

IC6001-100 REC
5.0Vp-p (10msec.div.)

IC6001-107 REC
5.0Vp-p (10msec.div.)

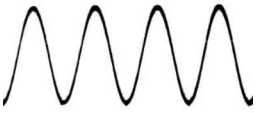


IC6001-111,112 REC
6.0Vp-p (10msec.div.)

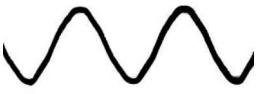


IC6001-114 PLAY
4.2Vp-p (10msec.div.)

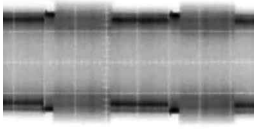
IC2501-1,2,16 REC
8.6Vp-p (5msec.div.)



IC3001-2 REC
1.2Vp-p (5msec.div.)

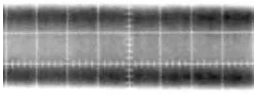


IC3001-4 PLAY
5.0Vp-p (5msec.div.)



IC3001-14 REC
0.4Vp-p (5msec.div.)

IC3001-15 PLAY
0.5Vp-p (20µsec.div.)



IC3001-20 PLAY
150mVp-p (20µsec. div.)

IC3001-24 REC/PLAY
5.0Vp-p (10msec. div.)

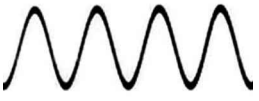
IC3001-37 REC/PLAY
5.0Vp-p (5msec. div.)

IC3001-38 REC/PLAY
5.0Vp-p (5msec. div.)

IC3001-42,43 PLAY
0.4Vp-p (20µsec. div.)

IC3001-48,50 REC
1.0Vp-p (20µsec. div.)

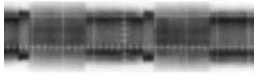
IC3001-52 REC/PLAY
2.0Vp-p (20µsec. div.)



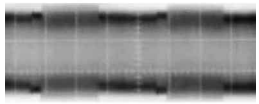
IC3001-73 REC
1.2Vp-p (5msec. div.)

IC3001-78 REC/PLAY
1.2Vp-p (5msec. div.)

IC3501-1 REC/PLAY
5.0Vp-p (10msec. div.)



IC3501-30 PLAY
0.4Vp-p (5msec. div.)



IC3501-31 REC
0.3Vp-p (5msec. div.)

SYSTEM CONTROL & SERVO ICs DC VOLTAGE CHART (SP MODE)

Ref. No.	IC1501								IC1502											
MODE	1	2	3	4					1	2	3	4								
STOP	1.2	2.3	4.9	0.0					0.0	1.2	4.9	0.0								
PLAY	1.2	2.3	4.2	0.0					0.0	1.2	4.9	0.0								
REC	1.2	2.3	4.8	0.0					0.0	1.2	4.8	0.0								
F.F	1.2	2.3	2.2	0.0					0.0	1.2	2.4	0.0								
REW	1.2	2.3	2.4	0.0					0.0	1.2	2.3	0.0								

Ref. No.	IC2501																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
STOP	16.8	16.8	16.8	4.9	4.9	1.2	1.1	0.0	2.7	1.5	0.0	4.1	4.1	3.7	0.0	16.8				
PLAY	14.9	14.9	15.2	1.1	4.9	1.1	1.2	0.6	2.4	1.5	0.0	3.8	3.8	3.8	0.0	14.9				
REC	15.1	15.1	15.4	1.0	4.9	1.1	1.2	0.6	2.4	1.5	0.0	3.8	3.8	3.8	0.0	15.1				
F.F	14.4	14.4	14.6	1.0	4.9	1.1	1.2	0.6	2.4	1.5	0.0	3.8	3.8	3.8	0.0	14.7				
REW	14.3	14.3	14.6	1.1	4.9	1.1	1.2	0.6	2.4	1.5	0.0	3.8	3.8	3.8	0.0	14.9				

Ref. No.	IC6001																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	0.0	1.9	0.0	0.0	3.5	0.0	0.0	0.0	2.4	0.0	0.0	4.9	4.9	4.7	4.1	0.0	4.9	0.0	0.0	0.0
PLAY	4.7	1.8	0.0	0.0	3.9	0.0	0.0	0.0	2.4	0.0	4.3	4.9	4.9	4.6	0.1	0.0	0.0	0.0	0.0	0.0
REC	4.7	1.9	0.0	0.0	2.2	0.0	0.0	0.0	2.4	0.0	0.0	4.9	4.8	4.6	4.0	0.0	0.0	0.0	4.9	0.0
F.F	4.9	1.8	0.0	0.0	3.5	0.0	0.0	0.0	2.4	0.0	0.0	4.9	4.8	4.8	4.1	0.0	4.9	0.0	0.0	0.0
REW	4.9	1.8	0.0	0.0	3.4	0.0	0.0	0.0	2.4	0.0	0.0	4.9	4.9	4.6	4.1	0.0	4.9	0.0	0.0	0.0

Ref. No.	IC6001																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
STOP	0.0	0.0	0.0	2.4	0.0	4.8	0.0	4.9	0.0	0.0	-	-	4.9	0.0	1.5	3.0	0.0	0.0	0.0	4.9
PLAY	2.4	0.0	0.0	2.4	2.4	4.8	0.0	0.0	0.0	0.0	-	-	4.9	0.0	1.5	3.0	4.9	0.0	0.0	4.9
REC	2.4	0.0	0.0	2.4	0.0	4.8	0.0	4.9	0.0	0.0	-	-	4.9	0.0	1.5	3.0	0.0	4.9	4.9	0.0
F.F	0.0	0.0	0.0	2.4	0.0	4.8	0.0	4.9	0.0	0.0	-	-	4.9	0.0	1.5	3.0	0.0	0.0	0.0	4.9
REW	0.0	0.0	0.0	2.4	0.0	4.8	0.0	4.9	0.0	0.0	-	-	4.9	0.0	1.5	3.0	0.0	0.0	0.0	4.9

Ref. No.	IC6001																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
STOP	0.0	0.0	5.0	4.9	0.0	0.0	0.0	0.0	0.0	0.0	4.9	4.9	1.5	2.1	4.9	1.9	0.0	2.4	4.9	0.0
PLAY	0.0	0.0	5.0	4.9	0.0	0.0	0.0	0.0	0.0	0.0	4.9	4.9	1.5	2.1	4.9	1.9	0.0	2.4	4.9	0.0
REC	0.0	4.9	5.0	4.9	0.0	0.0	0.0	0.0	0.0	0.0	4.9	4.9	1.5	2.1	4.8	1.9	0.0	2.4	4.9	0.0
F.F	0.0	0.0	5.0	4.9	4.9	0.0	0.0	0.0	0.0	0.0	4.9	4.9	1.5	2.1	4.9	1.9	0.0	2.5	4.9	0.0
REW	0.0	0.0	5.0	4.9	4.9	0.0	0.0	0.0	0.0	0.0	4.9	4.9	1.5	2.1	4.9	1.9	0.0	2.4	4.9	0.0

Ref. No.	IC6001																			
MODE	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
STOP	1.9	2.1	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	4.9	4.9	0.0	0.0	0.0	5.2	5.2	0.0	0.0	2.7
PLAY	1.9	2.1	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	4.9	4.8	0.0	0.0	0.0	5.2	5.2	0.0	2.4	2.4
REC	1.9	2.1	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	4.9	4.8	0.0	0.0	0.0	5.2	5.2	0.0	2.4	2.4
F.F	1.9	2.1	0.0	0.0	0.0	0.0	0.0	0.4	1.6	0.0	4.9	4.8	0.0	0.0	0.0	5.2	5.2	0.0	2.9	2.4
REW	1.9	2.1	0.0	0.0	0.0	0.0	0.0	0.4	1.6	0.0	4.9	4.8	0.0	0.0	0.0	5.2	5.2	0.0	2.9	2.4

Ref. No.	IC6001																			
MODE	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
STOP	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	4.9	4.9	4.9	2.4	4.9	4.9	4.9	4.9	4.8	4.8	4.1	4.1
PLAY	0.0	0.4	0.0	0.0	0.3	0.0	0.0	0.0	4.9	4.9	4.9	2.4	4.1	4.8	4.9	4.9	4.8	4.8	4.2	4.1
REC	0.0	0.4	0.0	0.0	4.5	0.0	0.0	0.0	4.9	4.9	4.9	2.4	4.2	4.8	4.9	4.9	4.8	4.8	4.1	4.0
F.F	0.0	4.8	0.0	0.0	0.3	0.0	0.0	0.0	4.9	4.9	4.9	2.4	2.3	2.3	4.9	4.9	4.8	4.8	4.2	4.1
REW	0.0	4.8	4.9	0.0	0.3	0.0	0.0	0.0	4.9	4.9	4.9	2.4	2.2	2.3	4.9	4.9	4.8	4.8	4.2	4.1

Ref. No.	IC6001																			
MODE	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116				
STOP	0.0	0.0	2.5	2.5	0.0	0.0	4.9	2.5	2.5	0.0	2.5	2.5	2.5	2.5	4.9	4.9				
PLAY	0.0	0.0	2.5	2.5	0.0	0.0	1.1	2.5	2.5	0.0	2.5	2.5	2.5	2.5	4.9	4.9				
REC	0.0	0.0	2.4	2.4	0.0	0.0	1.0	2.4	2.4	0.0	1.9	2.3	2.5	2.5	4.9	4.9				
F.F	0.0	0.0	2.5	2.5	0.0	0.0	1.0	2.5	2.5	0.0	2.5	2.5	2.5	2.5	5.0	5.0				
REW	0.0	0.0	2.5	2.5	0.0	0.0	1.1	2.5	2.5	0.0	2.5	2.5	2.5	2.5	5.0	5.0				

Ref. No.	IC7701																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	0.0	0.0	0.0	4.8	4.8	0.0	0.4	0.0	4.9	2.5	0.0	2.5	0.0	2.5	2.5	1.5	1.3	0.0	4.9	4.9
PLAY	0.0	0.0	0.0	4.8	4.8	0.0	0.4	0.0	4.9	3.0	0.0	3.1	0.0	3.5	3.1	1.5	1.3	0.0	4.9	4.9
REC	0.0	0.0	0.0	4.8	4.8	0.0	0.4	0.0	4.9	2.4	0.0	2.5	0.0	2.5	2.5	1.5	1.3	0.0	4.9	4.9
F.F	0.0	0.0	0.0	4.8	4.8	0.0	0.4	0.0	4.9	2.5	0.0	2.5	0.0	2.5	2.5	1.5	1.3	0.0	4.9	4.9
REW	0.0	0.0	0.0	4.8	4.8	0.0	0.4	0.0	4.9	2.5	0.0	2.5	0.0	2.5	2.5	1.5	1.3	0.0	4.9	4.9

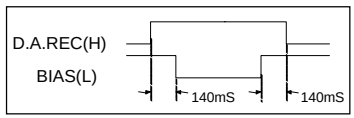
Ref. No.	IC7702							
MODE	1	2	3	4	5	6	7	8
STOP	0.0	0.0	0.0	0.0	4.8	4.8	4.9	4.9
PLAY	0.0	0.0	0.0	0.0	4.8	4.8	4.9	4.9
REC	0.0	0.0	0.0	0.0	4.8	4.8	4.9	4.9
F.F	0.0	0.0	0.0	0.0	4.8	4.8	4.9	4.9
REW	0.0	0.0	0.0	0.0	4.8	4.8	4.9	4.9

SYSTEM CONTROL & SERVO TRs DC VOLTAGE CHART (SP MODE)

Ref. No.	Q1501				Q1502				Q7701				Q7705				QR6001			
MODE	+	–			+	–			E	C	B		E	C	B		E	C	B	
STOP	4.7	0.0			4.9	0.0			1.6	0.0	0.9		1.2	4.9	1.9		0.0	0.0	4.9	
PLAY	4.7	0.0			4.9	0.0			1.6	0.0	0.9		1.3	4.9	1.9		0.0	12.3	0.0	
REC	4.6	0.0			4.8	0.0			1.6	0.0	0.9		1.2	4.9	1.9		0.0	0.0	4.9	
F.F	4.7	0.0			4.9	0.0			1.6	0.0	0.9		1.2	4.9	1.9		0.0	0.0	4.9	
REW	4.9	0.0			4.9	0.0			1.6	0.0	0.9		1.2	4.9	1.9		0.0	0.0	4.9	

Ref. No.	QR6006																			
MODE	E	C	B																	
STOP	0.0	0.0	4.9																	
PLAY	0.0	0.0	4.8																	
REC	0.0	0.0	4.8																	
F.F	0.0	0.0	4.8																	
REW	0.0	0.0	4.8																	

No.	Port Name	I/O	Description	P-OFF	P-Save	P-FAIL	Reset
1	CURRENT_LIMIT	O	Capstan motor current limit terminal.	Low	Low	Low	Low
2	F ADJUST	O	Analogue voltage output for HEAD frequency response adjustment	Low	Low	Low	Low
3	N.C.	--	Low fix (No Connection.)	Low	Low	Low	Low
4	C EMPHA(H)	O	Terminal of the Current emphasis video/FM audio recording current. [HIFI/2HEAD]:Fix to Low (Normal mode) [4HEAD] :Fix to Low (factory mode) Fix to High (Insert/AV Insert mode) Others (Depend on tape speed)	Low	Low	Low	Low
5	TRACKING_ENVE	O	Playback envelope input for auto tracking adjustment and cvc.	In	In	In	In
6	SLP(H)	O	Tape running speed output terminal.(Output signal depens on tape speed) [High]……During NTSC_10H or PAL_9H mode [Low]……Except NTSC_10H or PAL_9H mode	Low	Low	Low	Low
7	LP(H)	O	Tape running speed output terminal.(Output signal depens on tape speed) [High]……During NTSC_4H/6H or PAL_6H/9H mode [Low]……Except NTSC_4H/6H or PAL_6H/9H mode 2HEAD model: Low Fix	Low	Low	Low	Low
8	CPB	I	Input terminal for "PB (H)" from AV2. [High]…….3.85V - 5.0V [Midd]…….1.82V - 2.84V [Low]……. 0V - 0.81V	In	In	In	In
9	AFC S	I	"S-curve" Input terminal from tuner.	In	In	In	In
10	A-MUTE(H)	O	Audio mute output terminal for RF Converter.	High	High	Low	High
11	AV1_8IN	I	Input terminal for "PB (H)" from AV1. [High]…….3.85V - 5.0V [Midd]…….1.82V - 2.84V [Low]……. 0V - 0.81V	In	In	In	In
12	N/S/T2/T3	I	Mode select terminal [NORMAL mode]: More than 4.0V [SERVICE mode]: 2.5V - 4.0V [TEST_2 mode]: 1.0V - 2.5V [TEST_3 mode]: 0V - 1.0V	In	In	In	In
13	S-PHOTO	I	Tape end sensor input terminal.(Photo sensor input from supply side) [Black Tape]: more than 2.6V [Lead Tape]: Less than 2.4V	In	In	In	In
14	T-PHOTO	I	Tape beginning sensor input terminal.(Photo sensor input from take-up side) [Black Tape]: more than 2.6V [Lead Tape]: Less than 2.4V	In	In	In	In
15	ABS_NORM(H)	I	(Input terminal for FM audio enverope output level detection)	In	In	In	In
16	N.C	--	Low fix (No Connection.)	Low	Low	Low	Low
17	PLAY_REC(L)	O	Output terminal for switching the capstan voltage. [Other than PLAY/REC mode]……Always "High". [JOG/Shuttle mode in PLAY mode]……Always "High". After 5 seconds from PLAY/REC mode completion, it changes to "Low". During "Low" outputs, it checks every main capstan FG, when the no FG is inputted in a rotation, it changes to "High" and it keeps "high" by cassette ejection.	Low	Low	Low	Low
18	VSYNC(L)	O	Output terminal for V_sync detection result. [Vsync exist] : "Low" [Vsync not exist: "High"	Low	Low	Low	Low
19	D.FM.REC(H)	O	Timing output terminal for FM_Audio recording current.	Low	Low	Low	Low
20	ART.V/H/N	O	Output terminal for Artificial V synchronization signal.	Low	Low	Low	Low

No.	Port Name	I/O	Description	P-OFF	P-Save	P-FAIL	Reset
21	ROTARY.SW	O	Output terminal for rotary switch.	Low	Low	Low	Low
22	H.A.SW	O	Output terminal for HEAD AMP switch.	Low	Low	Low	Low
23	ENVE.SELECT	I	Input terminal for enverope selection.	Low	Low	Low	Low
24	VIDEO.H.SW	O	Output terminal for video HEAD switch.	Low	Low	Low	Low
25	A.H.SW	O	Output terminal for FM audio HEAD switch.	Low	Low	Low	Low
26	A.DEF(H)	O	Audio Mute output terminal for tuner and decoder. [High].....During VCR mode is NORMAL PLAY and VV mode.	Low	Low	Low	Low
27	PROG.ON(H)	O	I/O control to switch IIC bus for LW-programmer. H:IIC bus is connected to AV2. L:IIC bus is not connected to AV2.	Low	Low	Low	Low
28	AVPB-H(L)	O	"PB-(H)"output terminal for AV2 *Details, refer to 21pin control specifications. *The signal output from Pin-8 of 21pin terminal is shown below. pin8 \ Name / AVPB-H(L) / AVPBM-(H) High / L / Hi-Z Middle / H / Hi-Z Low / H / L	High	High	Low	High
29	AVPB-M(H)	O		Low	Low	Low	Low
30	GND(D)	--	GND	---	---	---	---
31	20MHz.IN	I	Main oscillator input	---	STOP	STOP	---
32	20MHz.OUT	O	Main oscillator output	---	STOP	STOP	---
33	+5V(D)	I	5V input terminal	---	---	---	---
34	32KHz IN	I	Sub oscillator input	---	---	---	---
35	32KHz OUT	O	Sub oscillator output	---	---	---	---
36	VCONT	I	Video Control	---	---	---	---
37	V EE(L)	O	Output terminal for switch between EE and VV.	Low	Low	Low	Low
38	D REC(H)	O	Output terminal for video recording current control.	Low	Low	Low	Low
39	D.A.REC(H)	O	Control terminal for normal audio recording current.	Low	Low	Low	Low
40	BIAS(L)	O	Bias oscillation Control terminal for Linear audio recording current. 	High	Hi-Z	Hi-Z	High
41	FM.MUTE(H)	O	Output terminal for audio mute control.	High	High	Low	High
42	FULL ERASE(H)	O	Output terminal for control FULL ERASE HEAD.	Low	Low	Low	Low
43	POWER_KEY	I	Input terminal for the unit power button. It switches ON to OFF and/or OFF to ON when down edge is detected.	In	In	In	In
44	POS.SW3	I	Input terminal for mecha position.	In	In	In	In
45	POS.SW2	I	Input terminal for mecha position.	In	In	In	In
46	POS.SW1	I	Input terminal for mecha position.	In	In	In	In
47	POWER OFF(H)	O	ON/OFF Control terminal for power circuit. Power off condition: "High" is existed. ("Low" is existed when the mechanism and/or circuit operation is activated.)	High	High	Low	High
48	FIP(L)	O	Output terminal for FIP on/off control signal. ("Low" is existed when the power off condition under the "FIP OFF" setting.)	Not fix	High	Low	Low
49	P50 IN	I	Input terminal for Project 50 serial signal.	In	In	In	In
50	LC.OSC IN	I	The oscillation input terminal for OSD dot clock.	---	---	---	---

No.	Port Name	I/O	Description	P-OFF	P-Save	P-FAIL	Reset
51	LC.OSC OUT	O	The oscillation output terminal for OSD dot clock.	---	---	---	---
52	RESET(L)	I	Input terminal for microprocessor reset.	In	In	In	In
53	4FC.LPF	I	4fc clock input terminal	---	---	---	---
54	OSD.FSC IN	I	OSD clock input terminal	---	---	---	---
55	5V(OSD)	I	5V input terminal	---	---	---	---
56	CVIN	I	Input terminal for Composite video signal.	---	---	---	---
57	GND(OSD)	--	GND	---	---	---	---
58	LECHA	I	Input terminal for Composite video signal.(White level)	---	---	---	---
59	20M.START(H)	I	Switching terminal for stertting Mode.(High speed/Low speed)	---	---	---	---
60	MD0	I	Mode setting terminal for flash over-write.	---	---	---	---
61	CVOUT	O	Output terminal for CG Video.	---	---	---	---
62	HLF	O	LPF connecting terminal for the slicer. (For OSD dot clock.)	---	---	---	---
63	SECAM.V.IN	I	Chrominance input terminal for SECAM super impose.	---	---	---	---
64	GND	--	Connect to GND	In	In	In	In
65	S TAB(L)	I	Input terminal for the prevention tab. [EXIST] :LOW [NO EXIST] :HIGH	In	In	In	In
66	UNLOADING(H)	O	Control terminal for loading motor. [Reverse rotation / brake] : "High"	Low	Low	Low	Low
67	LOADING(H)	O	Control terminal for loading motor. [forward rotation / brake] : "High"	Low	Low	Low	Low
68	C.SYNC	I	Input terminal for composite V-sync signal.	In	In	In	In
69	EX.FF/REW(L)	I	Filter control terminal for PB-CTL signal in FF/REW.	Low	Low	Low	Low
70	PAL-I/BG/DK(SYS4)	O	Output terminal for TV broadcast system switching signal for video circuit control.	Not fix	Low	Low	Low
71	SECAM/PAL(SYS2)	O	Output terminal for TV broadcast system switching signal for video circuit control.	Not fix	Low	Low	Low
72	SLEEP(L)	O	Output terminal for super power save mode setting. P-OFF in the super power save mode…… "Low".	High	Low	Low	High
73	PB60Hz(H)	O	Switching terminal for NTSC FM Audio trap filter in PB. [VV (PB,Trick_PB/A-DUB, A-DUB-PS) mode and CTL is 60Hz] : "High" [Other than above condition] : "Low"	Low	Low	Low	Low
74	ADUB(H)	O	Switching terminal for Bias oscillation noise filter in A-DUB mode. [ADUB/ADUB-PS(Including Assemble/syncro/AV-Insert)] : "High" [Other than above condition] : "Hi-Z"	Hi-Z	Hi-Z	Hi-Z	Hi-Z
75	N.C(VBI1)	--	Fix to Low.	Low	Low	Low	Low
76	P FAIL	I	Input terminal for Interrupt signal for power fail detection.	In	In	In	In
77	IR	I	Input terminal for Interrupt signal from IR sensor emitted by Remo-Con.	In	In	In	In
78	P50 OUT	O	Output terminal for Project 50 serial data.	Not fix	Low	Low	Low
79	CAP.ET	O	Output terminal for Capstan Torque command.	0V	0V	Low	0V
80	CYL.ET	O	Output terminal for Cylinder Torque command.	4.213V	4.213V	Low	4.213V
81	DIGI.LINK	O	Control signal for switching IR sensor.[only LOEWE model]	Low	Low	Low	Low
82	HALF_WAVE(H)	O	Switching terminal for capstan driver speed mode.(FAST/SLOW)	In	In	In	In
83	CAP.R/F	O	Switching terminal for capstan motor rotating direction.	Low	Low	Low	Low
84	125Hz	O	125Hz pulse output terminal for clock adjustment.	Not fix	Low	Low	Low
85	SHORT_DN	I	Short Circuit detection terminal for oscillation circuit in REC. *When the "BIAS(H)" is "Low" and this terminal is "High", "F08" is displayed. *When the "BIAS(H)" is "High" and this terminal is "low", "F07" is displayed.	In	In	In	In
86	N.C	--	Fix to Low.	Low	Low	Low	Low
87	N.C	--	Fix to Low.	Low	Low	Low	Low
88	N.C	--	Fix to Low.	Low	Low	Low	Low
89	FLD/T2 CLK	O	Serial clock output terminal for FIP driver and TEST_2(Factory use).	Not fix	Low	Low	Low
90	FLD/T2 DATA IN	I	Serial data input terminal for FIP driver and TEST_2(Factory use).	Not fix	In	In	In

No.	Port Name	I/O	Description	P-OFF	P-Save	P-FAIL	Reset
91	FLD/T2 DATA OUT	O	Serial data output terminal for FIP driver and TEST_2(Factory use).	Not fix	Low	Low	Low
92	FLD_CS	O	Chip select terminal for FIP driver.	Not fix	Low	Low	Low
93	T.REEL.PULSE	I	Input terminal for Take-up Reel sensor pulse.	In	In	In	In
94	S.REEL.PULSE	I	Input terminal for Supply Reel sensor pulse.	In	In	In	In
95	DAVN	I	DAVN signal from Slicer	In	In	In	In
96	EEP_WR	O	Write enable for EEPROM H:READ only L:Write	High	High	Low	High
97	OSD IIC CLK	O	IIC clock for EEPROM,I/O and slicer	Not fix	Low	Low	Low
98	OSD IIC DATA	I/O	IIC data for EEPROM,I/O and slicer	Not fix	Low	Low	Low
99	MAIN IIC CLK	O	IIC clock for AV1CHIP,FM audio,Tuner,Decoder and RFC	Not fix	Low	Low	Low
100	MAIN IIC DATA	I/O	IIC data for AV1CHIP,FM audio,Tuner,Decoder and RFC	Not fix	Low	Low	Low
101	N.C	--	Low fix terminal.	Low	Low	Low	Low
102	N.C	--	Low fix terminal.	Low	Low	Low	Low
103	FG.AMP.OUT	O	Output from internal FG Amplifier	---	---	---	---
104	FG.AMP.IN	I	Input for internal FG Amplifier	---	---	---	---
105	GND(A)	--	GND	---	---	---	---
106	GND	--	GND	---	---	---	---
107	PFG	I	Cylinder PG/FG input terminal	---	---	---	---
108	OREF	O	Output from internal reference voltage (2.5V)	---	---	---	---
109	IREF	I	Input for internal reference voltage	---	---	---	---
110	to GND	--	Connect to GND	---	---	---	---
111	CTL.HEAD(-)	I	Input signal from CTL HEAD(+)	---	---	---	---
112	CTL.HEAD(+)	I	Input signal from CTL HEAD(-)	---	---	---	---
113	CTL.AMP.REF	I	Input for internal CTL amplifier reference voltage	---	---	---	---
114	PB.CTL.OUT	O	Output from internal CTL amplifier	---	---	---	---
115	+5V(A)	I	5V input terminal	---	---	---	---
116	+5V(AD)	I	5V input terminal	---	---	---	---

INPUT CONDITION							VIDEO OUTPUT RESULT							AUDIO OUTPUT RESULT				
POWER	AV2 SELECT	TV/ VTR	EE/ VV	OSD ON(H)	INPUT CH	AV2 PB(H)	AV1 OUT	AV2 OUT	AV1 PB(H)	AV2 PB(H)	RGB SW	VCR IN	VCR OUT	AV1 Out	AV2 Out	RF (C)	AV1 Out Selector	AV2 Out Selector
OFF	---	---	---	---	---	L	AV2 In	AV1 In	L	L	OFF	TUN	TUN	AV2 In	AV1 In	Mute	AV2 In	AV1 In
						M/H	AV2 In	AV1 In	M/H	L	ON	TUN	TUN	AV2 In	AV1 In	Mute	AV2 In	AV1 In
VPS STAND BY or Personal Planner Standby	EXT or TIMER1 or TIMER2	---	---	L	NO.TU	L	AV2 In	AV1 In	L	L	OFF	TUN	TUN	AV2 In	AV1 In	Mute	AV2 In	AV1 In
						M/H	AV2 In	AV1 In	*[M/H]	L	ON	TUN	TUN	AV2 In	AV1 In	Mute	AV2 In	AV1 In
					C+.TU	L	AV2 In	AV1 In	L	L	OFF	TUN	TUN	AV2 In	AV1 In	Mute	AV2 In	AV1 In
						M/H	AV2 In	AV1 In	*[M/H]	L	ON	TUN	TUN	AV2 In	AV1 In	Mute	AV2 In	AV1 In
					AV1	L	AV2 In	AV1 In	L	L	OFF	AV1	AV1	AV2 In	AV1 In	Mute	AV2 In	AV1 In
						M/H	AV2 In	AV1 In	*[M/H]	L	ON	AV1	AV1	AV2 In	AV1 In	Mute	AV2 In	AV1 In
					AV2	L	AV2 In	AV1 In	L	L	OFF	AV2	AV2	AV2 In	AV1 In	Mute	AV2 In	AV1 In
						M/H	AV2 In	AV1 In	*[M/H]	L	ON	AV2	AV2	AV2 In	AV1 In	Mute	AV2 In	AV1 In
					AV3	L	AV2 In	AV1 In	L	L	OFF	AV3	AV3	AV2 In	AV1 In	Mute	AV2 In	AV1 In
						M/H	AV2 In	AV1 In	*[M/H]	L	ON	AV3	AV3	AV2 In	AV1 In	Mute	AV2 In	AV1 In
					SAT.NO	L	AV2 In	AV1 In	L	L	OFF	SAT	SAT	AV2 In	AV1 In	Mute	AV2 In	AV1 In
						M/H	AV2 In	AV1 In	*[M/H]	L	ON	SAT	SAT	AV2 In	AV1 In	Mute	AV2 In	AV1 In
					SAT.C+	L	AV2 In	AV1 In	L	L	OFF	SAT	SAT	AV2 In	AV1 In	Mute	AV2 In	AV1 In
						M/H	AV2 In	AV1 In	*[M/H]	L	ON	SAT	SAT	AV2 In	AV1 In	Mute	AV2 In	AV1 In
				H	NO.TU	L	VCR out	AV1 In	H	H	OFF	TUN	TUN	Mute	Mute	Mute	TUN	AV1 In
						M/H	VCR out	AV1 In	H	H	OFF	TUN	TUN	Mute	Mute	Mute	TUN	AV1 In
					C+.TU	L	VCR out	AV1 In	H	H	OFF	TUN	TUN	Mute	Mute	Mute	TUN	AV1 In
						M/H	VCR out	AV1 In	H	H	OFF	TUN	TUN	Mute	Mute	Mute	TUN	AV1 In
					AV1	L	VCR out	AV1 In	H	H	OFF	AV1	AV1	Mute	Mute	Mute	AV1 In	AV1 In
						M/H	VCR out	AV1 In	H	H	OFF	AV1	AV1	Mute	Mute	Mute	AV1 In	AV1 In
					AV2	L	VCR out	AV1 In	H	H	OFF	AV2	AV2	Mute	Mute	Mute	AV2 In	AV1 In
						M/H	VCR out	AV1 In	H	H	OFF	AV2	AV2	Mute	Mute	Mute	AV2 In	AV1 In
					AV3	L	VCR out	AV1 In	H	H	OFF	AV3	AV3	Mute	Mute	Mute	AV3 In	AV1 In
						M/H	VCR out	AV1 In	H	H	OFF	AV3	AV3	Mute	Mute	Mute	AV3 In	AV1 In
					SAT.NO	L	VCR out	AV1 In	H	H	OFF	SAT	SAT	Mute	Mute	Mute	SAT	AV1 In
						M/H	VCR out	AV1 In	H	H	OFF	SAT	SAT	Mute	Mute	Mute	SAT	AV1 In
					SAT.C+	L	VCR out	AV1 In	H	H	OFF	SAT	SAT	Mute	Mute	Mute	SAT	AV1 In
						M/H	VCR out	AV1 In	H	H	OFF	SAT	SAT	Mute	Mute	Mute	SAT	AV1 In
	DECODER	---	---	L	NO.TU	L	AV2 In	AV1 In	L	L	OFF	TUN	TUN	AV2 In	AV1 In	Mute	AV2 In	AV1 In
						M/H	AV2 In	AV1 In	M/H	L	ON	TUN	TUN	AV2 In	AV1 In	Mute	AV2 In	AV1 In
					C+.TU	L	AV2 In	AV1 In	L	L	OFF	TUN	TUN	AV2 In	AV1 In	Mute	AV2 In	AV1 In
						M/H	AV2 In	AV1 In	M/H	L	ON	TUN	TUN	AV2 In	AV1 In	Mute	AV2 In	AV1 In
					AV1	L	AV2 In	AV1 In	L	L	OFF	AV1	AV1	AV2 In	AV1 In	Mute	AV2 In	AV1 In
						M/H	AV2 In	AV1 In	M/H	L	ON	AV2	AV2	AV2 In	AV1 In	Mute	AV2 In	AV1 In
					AV2	L	AV2 In	AV1 In	L	L	OFF	AV2	AV2	AV2 In	AV1 In	Mute	AV2 In	AV1 In
						M/H	AV2 In	AV1 In	M/H	L	ON	AV2	AV2	AV2 In	AV1 In	Mute	AV2 In	AV1 In
					AV3	L	AV2 In	AV1 In	L	L	OFF	AV3	AV3	AV2 In	AV1 In	Mute	AV2 In	AV1 In
						M/H	AV2 In	AV1 In	M/H	L	ON	AV3	AV3	AV2 In	AV1 In	Mute	AV2 In	AV1 In
					SAT.NO	L	AV2 In	AV1 In	L	L	OFF	SAT	SAT	AV2 In	AV1 In	Mute	AV2 In	AV1 In
						M/H	AV2 In	AV1 In	M/H	L	ON	SAT	SAT	AV2 In	AV1 In	Mute	AV2 In	AV1 In
					SAT.C+	L	AV2 In	AV1 In	L	L	OFF	SAT	SAT	AV2 In	AV1 In	Mute	AV2 In	AV1 In
						M/H	AV2 In	AV1 In	M/H	L	ON	SAT	SAT	AV2 In	AV1 In	Mute	AV2 In	AV1 In
				H	NO.TU	L	VCR out	AV1 In	H	L	OFF	TUN	TUN	Mute	Mute	Mute	TUN	AV1 In
						M/H	VCR out	AV1 In	H	L	OFF	TUN	TUN	Mute	Mute	Mute	TUN	AV1 In
					C+.TU	L	VCR out	AV1 In	H	L	OFF	TUN	TUN	Mute	Mute	Mute	TUN	AV1 In
						M/H	VCR out	AV1 In	H	L	OFF	TUN	TUN	Mute	Mute	Mute	TUN	AV1 In
					AV1	L	VCR out	AV1 In	H	L	OFF	AV1	AV1	Mute	Mute	Mute	AV1 In	AV1 In
						M/H	VCR out	AV1 In	H	L	OFF	AV2	AV2	Mute	Mute	Mute	AV2 In	AV1 In
					AV2	L	VCR out	AV1 In	H	L	OFF	AV2	AV2	Mute	Mute	Mute	AV2 In	AV1 In
						M/H	VCR out	AV1 In	H	L	OFF	AV2	AV2	Mute	Mute	Mute	AV2 In	AV1 In
					AV3	L	VCR out	AV1 In	H	L	OFF	AV3	AV3	Mute	Mute	Mute	AV3 In	AV1 In
						M/H	VCR out	AV1 In	H	L	OFF	AV3	AV3	Mute	Mute	Mute	AV3 In	AV1 In
					SAT.NO	L	VCR out	AV1 In	H	L	OFF	SAT	SAT	Mute	Mute	Mute	SAT	AV1 In
						M/H	VCR out	AV1 In	H	L	OFF	SAT	SAT	Mute	Mute	Mute	SAT	AV1 In
					SAT.C+	L	VCR out	AV1 In	H	L	OFF	SAT	SAT	Mute	Mute	Mute	SAT	AV1 In
						M/H	VCR out	AV1 In	H	L	OFF	SAT	SAT	Mute	Mute	Mute	SAT	AV1 In

INPUT CONDITION							VIDEO OUTPUT RESULT							AUDIO OUTPUT RESULT				
POWER	AV2 SELECT	TV/ VTR	EE/ VV	OSD ON(H)	INPUT CH	AV2 PB(H)	AV1 OUT	AV2 OUT	AV1 PB(H)	AV2 PB(H)	RGB SW	VCR IN	VCR OUT	AV1 Out	AV2 Out	RF (C)	AV1 Out Selector	AV2 Out Selector
P.ON	EXT	TV	EE	L	NO.TU	---	VCR out	VCR out	L	L	OFF	TUN	TUN	TUN	TUN	TUN	TUN	INSEL
					C+.TU	---	VCR out	VCR out	L	L	OFF	TUN	TUN	TUN	TUN	TUN	TUN	INSEL
	or				AV1	---	VCR out	VCR out	L	L	OFF	AV1	AV1	AV1 In	AV1 In	AV1 In	AV1 In	INSEL
					AV2	---	VCR out	VCR out	L	L	ON	AV2	AV2	AV2 In	AV2 In	AV2 In	AV2 In	INSEL
	TIMER1				AV3	---	VCR out	VCR out	L	L	OFF	AV3	AV3	AV3 In	AV3 In	AV3 In	AV3 In	INSEL
					SAT.NO	---	VCR out	VCR out	L	L	OFF	SAT	SAT	SAT	SAT	SAT	SAT	INSEL
	or				SAT.C+	---	VCR out	VCR out	L	L	OFF	SAT	SAT	SAT	SAT	SAT	SAT	INSEL
				H	NO.TU	---	VCR out	VCR out	H	H	OFF	TUN	TUN	TUN	TUN	TUN	TUN	INSEL
	TIMER2				C+.TU	---	VCR out	VCR out	H	H	OFF	TUN	TUN	TUN	TUN	TUN	TUN	INSEL
					AV1	---	VCR out	VCR out	H	H	OFF	AV1	AV1	AV1 In	AV1 In	AV1 In	AV1 In	INSEL
					AV2	---	VCR out	VCR out	H	H	OFF	AV2	AV2	AV2 In	AV2 In	AV2 In	AV2 In	INSEL
					AV3	---	VCR out	VCR out	H	H	OFF	AV3	AV3	AV3 In	AV3 In	AV3 In	AV3 In	INSEL
					SAT.NO	---	VCR out	VCR out	H	H	OFF	SAT	SAT	SAT	SAT	SAT	SAT	INSEL
					SAT.C+	---	VCR out	VCR out	H	H	OFF	SAT	SAT	SAT	SAT	SAT	SAT	INSEL
		VTR	EE	L	NO.TU	---	VCR out	VCR out	H	H	OFF	TUN	TUN	TUN	TUN	TUN	TUN	INSEL
					C+.TU	---	VCR out	VCR out	H	H	OFF	TUN	TUN	TUN	TUN	TUN	TUN	INSEL
					AV1	---	VCR out	VCR out	H	H	OFF	AV1	AV1	AV1 In	AV1 In	AV1 In	AV1 In	INSEL
					AV2	L	VCR out	VCR out	H	H	ON	AV2	AV2	AV2 In	AV2 In	AV2 In	AV2 In	INSEL
						M/H	VCR out	VCR out	M/H	M/H	ON	AV2	AV2	AV2 In	AV2 In	AV2 In	AV2 In	INSEL
					AV3	---	VCR out	VCR out	H	H	OFF	AV3	AV3	AV3 In	AV3 In	AV3 In	AV3 In	INSEL
					SAT.NO	---	VCR out	VCR out	H	H	OFF	SAT	SAT	SAT	SAT	SAT	SAT	INSEL
					SAT.C+	---	VCR out	VCR out	H	H	OFF	SAT	SAT	SAT	SAT	SAT	SAT	INSEL
				H	NO.TU	---	VCR out	VCR out	H	H	OFF	TUN	TUN	TUN	TUN	TUN	TUN	INSEL
					C+.TU	---	VCR out	VCR out	H	H	OFF	TUN	TUN	TUN	TUN	TUN	TUN	INSEL
P.ON	EXT	VTR	EE	H	AV1	---	VCR out	VCR out	H	H	OFF	AV1	AV1	AV1 In	AV1 In	AV1 In	AV1 In	INSEL
					AV2	---	VCR out	VCR out	H	H	OFF	AV2	AV2	AV2 In	AV2 In	AV2 In	AV2 In	INSEL
					AV3	---	VCR out	VCR out	H	H	OFF	AV3	AV3	AV3 In	AV3 In	AV3 In	AV3 In	INSEL
					SAT.NO	---	VCR out	VCR out	H	H	OFF	SAT	SAT	SAT	SAT	SAT	SAT	INSEL
					SAT.C+	---	VCR out	VCR out	H	H	OFF	SAT	SAT	SAT	SAT	SAT	SAT	INSEL
			VV	---	NO.TU	---	VCR out	VCR out	M/H	M/H	OFF	TUN	PB	PB	PB	PB	TUN	INSEL
					C+.TU	---	VCR out	VCR out	M/H	M/H	OFF	TUN	PB	PB	PB	PB	TUN	INSEL
					AV1	---	VCR out	VCR out	M/H	M/H	OFF	AV1	PB	PB	PB	PB	AV1 In	INSEL
					AV2	---	VCR out	VCR out	M/H	M/H	OFF	AV2	PB	PB	PB	PB	AV2 In	INSEL
					AV3	---	VCR out	VCR out	M/H	M/H	OFF	AV3	PB	PB	PB	PB	AV3 In	INSEL
					SAT.NO	---	VCR out	VCR out	M/H	M/H	OFF	SAT	PB	PB	PB	PB	SAT	INSEL
					SAT.C+	---	VCR out	VCR out	M/H	M/H	OFF	SAT	PB	PB	PB	PB	SAT	INSEL
	DECODER	TV	EE	L	NO.TU	L	VCR out	AV1 In	L	L	OFF	TUN	TUN	TUN	AV1 In	TUN	TUN	AV1 In
						M/H	AV2 In	AV1 In	M/H	L	ON	TUN	TUN	AV2 In	AV1 In	TUN	AV2 In	AV1 In
					C+.TU	L	VCR out	TUN IN	L	L	OFF	TUN	TUN	TUN	TUN	TUN	TUN	TUN
						M/H	VCR out	TUN IN	L	L	OFF	AV2	AV2	AV2 In	TUN	AV2 In	AV2 In	TUN
					AV1	L	VCR out	AV1 In	L	L	OFF	AV1	AV1	AV1 In	AV1 In	AV1 In	AV1 In	AV1 In
						M/H	AV2 In	AV1 In	M/H	L	ON	AV2	AV2	AV2 In	AV1 In	AV2 In	AV2 In	AV1 In
					AV2	L	VCR out	AV1 In	L	L	ON	AV2	AV2	AV2 In	AV1 In	AV2 In	AV2 In	AV1 In
						M/H	AV2 In	AV1 In	M/H	L	ON	AV2	AV2	AV2 In	AV1 In	AV2 In	AV2 In	AV1 In
					AV3	L	VCR out	AV1 In	L	L	OFF	AV3	AV3	AV3 In	AV1 In	AV3 In	AV3 In	AV1 In
						M/H	AV2 In	AV1 In	M/H	L	ON	AV3	AV3	AV2 In	AV1 In	AV3 In	AV2 In	AV1 In
					SAT.NO	L	VCR out	AV1 In	L	L	OFF	SAT	SAT	SAT	AV1 In	SAT	SAT	AV1 In
						M/H	AV2 In	AV1 In	M/H	L	ON	SAT	SAT	AV2 In	AV1 In	SAT	AV2 In	AV1 In
					SAT.C+	L	VCR out	SAT IN	L	L	OFF	SAT	SAT	SAT	SAT	SAT	SAT	TUN
						M/H	VCR out	SAT IN	L	L	OFF	AV2	AV2	AV2 In	SAT	AV2 In	AV2 In	TUN
				H	NO.TU	L	VCR out	AV1 In	H	L	OFF	TUN	TUN	TUN	AV1 In	TUN	TUN	AV1 In
						M/H	VCR out	AV1 In	H	L	OFF	TUN	TUN	TUN	AV1 In	TUN	TUN	AV1 In
					C+.TU	L	VCR out	TUN IN	H	L	OFF	TUN	TUN	TUN	TUN	TUN	TUN	TUN
						M/H	VCR out	TUN IN	H	L	OFF	AV2	AV2	AV2 In	TUN	AV2 In	AV2 In	TUN
					AV1	L	VCR out	AV1 In	H	L	OFF	AV1	AV1	AV1 In	AV1 In	AV1 In	AV1 In	AV1 In
						M/H	VCR out	AV1 In	H	L	OFF	AV2	AV2	AV2 In	AV1 In	AV2 In	AV2 In	AV1 In
					AV2	L	VCR out	AV1 In	H	L	OFF	AV2	AV2	AV2 In	AV1 In	AV2 In	AV2 In	AV1 In
						M/H	VCR out	AV1 In	H	L	OFF	AV2	AV2	AV2 In	AV1 In	AV2 In	AV2 In	AV1 In
					AV3	L	VCR out	AV1 In	H	L	OFF	AV3	AV3	AV3 In	AV1 In	AV3 In	AV3 In	AV1 In
						M/H	VCR out	AV1 In	H	L	OFF	AV3	AV3	AV3 In	AV1 In	AV3 In	AV3 In	AV1 In
					SAT.NO	L	VCR out	AV1 In	H	L	OFF	SAT	SAT	SAT	AV1 In	SAT	SAT	AV1 In
						M/H	VCR out	AV1 In	H	L	OFF	SAT	SAT	SAT	AV1 In	SAT	SAT	AV1 In
					SAT.C+	L	VCR out	SAT IN	H	L	OFF	SAT	SAT	SAT	SAT	SAT	SAT	SAT
						M/H	VCR out	SAT IN	H	L	ON	AV2	AV2	AV2 In	SAT	AV2 In	AV2 In	SAT

INPUT CONDITION							VIDEO OUTPUT RESULT							AUDIO OUTPUT RESULT				
POWER	AV2 SELECT	TV/ VTR	EE/ VV	OSD ON(H)	INPUT CH	AV2 PB(H)	AV1 OUT	AV2 OUT	AV1 PB(H)	AV2 PB(H)	RGB SW	VCR IN	VCR OUT	AV1 Out	AV2 Out	RF (C)	AV1 Out Selector	AV2 Out Selector
P.ON	DECODER	VTR	EE	L	NO.TU	L	VCR out	AV1 In	H	L	OFF	TUN	TUN	TUN	AV1 In	TUN	TUN	AV1 In
						M/H	VCR out	AV1 In	H	L	OFF	TUN	TUN	TUN	AV1 In	TUN	TUN	AV1 In
					C+.TU	L	VCR out	TUN IN	H	L	OFF	TUN	TUN	TUN	TUN	TUN	TUN	TUN
						M/H	VCR out	TUN IN	M/H	L	ON	AV2	AV2	AV2 In	TUN	AV2 In	AV2 In	TUN
					AV1	L	VCR out	AV1 In	H	L	OFF	AV1	AV1	AV1 In	AV1 In	AV1 In	AV1 In	AV1 In
						M/H	VCR out	AV1 In	M/H	L	ON	AV2	AV2	AV2 In	AV1 In	AV2 In	AV2 In	AV1 In
					AV2	L	VCR out	AV1 In	H	L	ON	AV2	AV2	AV2 In	AV1 In	AV2 In	AV2 In	AV1 In
						M/H	VCR out	AV1 In	M/H	L	ON	AV2	AV2	AV2 In	AV1 In	AV2 In	AV2 In	AV1 In
					AV3	L	VCR out	AV1 In	H	L	OFF	AV3	AV3	AV3 In	AV1 In	AV3 In	AV3 In	AV1 In
						M/H	VCR out	AV1 In	M/H	L	OFF	AV3	AV3	AV3 In	AV1 In	AV3 In	AV3 In	AV1 In
					SAT.NO	L	VCR out	AV1 In	H	L	OFF	SAT	SAT	SAT	AV1 In	SAT	SAT	AV1 In
						M/H	VCR out	AV1 In	H	L	OFF	SAT	SAT	SAT	AV1 In	SAT	SAT	AV1 In
					SAT.C+	L	VCR out	SAT IN	H	L	OFF	SAT	SAT	SAT	SAT	SAT	SAT	SAT
						M/H	VCR out	SAT IN	M/H	L	ON	AV2	AV2	AV2 In	SAT	AV2 In	AV2 In	SAT
				H	NO.TU	L	VCR out	AV1 In	H	L	OFF	TUN	TUN	TUN	AV1 In	TUN	TUN	AV1 In
						M/H	VCR out	AV1 In	H	L	OFF	TUN	TUN	TUN	AV1 In	TUN	TUN	AV1 In
					C+.TU	L	VCR out	TUN IN	H	L	OFF	TUN	TUN	TUN	TUN	TUN	TUN	TUN
						M/H	VCR out	TUN IN	H	L	OFF	AV2	AV2	AV2 In	TUN	AV2 In	AV2 In	TUN
					AV1	L	VCR out	AV1 In	H	L	OFF	AV1	AV1	AV1 In	AV1 In	AV1 In	AV1 In	AV1 In
						M/H	VCR out	AV1 In	H	L	OFF	AV2	AV2	AV2 In	AV1 In	AV2 In	AV2 In	AV1 In
					AV2	L	VCR out	AV1 In	H	L	OFF	AV2	AV2	AV2 In	AV1 In	AV2 In	AV2 In	AV1 In
						M/H	VCR out	AV1 In	H	L	OFF	AV2	AV2	AV2 In	AV1 In	AV2 In	AV2 In	AV1 In
					AV3	L	VCR out	AV1 In	H	L	OFF	AV3	AV3	AV3 In	AV1 In	AV3 In	AV3 In	AV1 In
						M/H	VCR out	AV1 In	H	L	OFF	AV3	AV3	AV3 In	AV1 In	AV3 In	AV3 In	AV1 In
					SAT.NO	L	VCR out	AV1 In	H	L	OFF	SAT	SAT	SAT	AV1 In	SAT	SAT	AV1 In
						M/H	VCR out	AV1 In	H	L	OFF	SAT	SAT	SAT	AV1 In	SAT	SAT	AV1 In
					SAT.C+	L	VCR out	SAT IN	H	L	OFF	SAT	SAT	SAT	SAT	SAT	SAT	SAT
						M/H	VCR out	SAT IN	H	L	OFF	AV2	AV2	AV2 In	SAT	AV2 In	AV2 In	SAT
			VV	---	NO.TU	L	VCR out	AV1 In	M/H	L	OFF	TUN	PB	PB	AV1 In	PB	TUN	AV1 In
						M/H	VCR out	AV1 In	M/H	L	OFF	TUN	PB	PB	AV1 In	PB	TUN	AV1 In
					C+.TU	L	VCR out	TUN IN	M/H	L	OFF	TUN	PB	PB	TUN	PB	TUN	TUN
						M/H	VCR out	TUN IN	M/H	L	OFF	AV2	PB	PB	TUN	PB	AV2 In	TUN
					AV1	L	VCR out	AV1 In	M/H	L	OFF	AV1	PB	PB	AV1 In	PB	AV1 In	AV1 In
						M/H	VCR out	AV1 In	M/H	L	OFF	AV2	PB	PB	AV1 In	PB	AV2 In	AV1 In
					AV2	L	VCR out	AV1 In	M/H	L	OFF	AV2	PB	PB	AV1 In	PB	AV2 In	AV1 In
						M/H	VCR out	AV1 In	M/H	L	OFF	AV2	PB	PB	AV1 In	PB	AV2 In	AV1 In
					AV3	L	VCR out	AV1 In	M/H	L	OFF	AV3	PB	PB	AV1 In	PB	AV3 In	AV1 In
						M/H	VCR out	AV1 In	M/H	L	OFF	AV3	PB	PB	AV1 In	PB	AV3 In	AV1 In
					SAT.NO	L	VCR out	AV1 In	M/H	L	OFF	SAT	PB	PB	AV1 In	PB	SAT	AV1 In
						M/H	VCR out	AV1 In	M/H	L	OFF	SAT	PB	PB	AV1 In	PB	SAT	AV1 In
					SAT.C+	L	VCR out	SAT IN	M/H	L	OFF	SAT	PB	PB	SAT	PB	SAT	SAT
						M/H	VCR out	SAT IN	M/H	L	OFF	AV2	PB	PB	SAT	PB	AV2 In	SAT

NOTE: NO.TU: Tuner position, DECODER OFF (e.g. ARD) RGB SW : OFF = HIGH, ON=LOW

C+TU: Tuner position, DECODER ON (e.g. PREMI) EE : Non-Playback signal VV:Playback signal

***[M/H] :In case of Personal Planner standby(not External Link), AV1 PB must not output 'M' or 'H'**

INPUT CONDITION						VIDEO OUTPUT RESULT							AUDIO OUTPUT RESULT				
POWER	AV2 SELECT	EE/ VV	OSD ON(H)	INPUT CH	AV2 PB(H)	AV1 OUT	AV2 OUT	AV1 PB(H)	AV2 PB(H)	RGB SW	VCR IN	VCR OUT	AV1 Out	AV2 Out	RF (C)	AV1 Out Selector	AV2 Out Selector
OFF	---	---	---	---	L	AV2 In	AV1 In	L	L	OFF	TUN	TUN	AV2 In	AV1 In	Mute	AV2 In	AV1 In
					M/H	AV2 In	AV1 In	M/H	L	ON	TUN	TUN	AV2 In	AV1 In	Mute	AV2 In	AV1 In
PDC STAND BY or TIMER1 or Personal Planner Standby	EXT or TIMER2	---	L	TUN	L	AV2 In	AV1 In	L	L	OFF	TUN	TUN	AV2 In	AV1 In	Mute	AV2 In	AV1 In
					M/H	AV2 In	AV1 In	*[M/H]	L	ON	TUN	TUN	AV2 In	AV1 In	Mute	AV2 In	AV1 In
				AV1	L	AV2 In	AV1 In	L	L	OFF	AV1	AV1	AV2 In	AV1 In	Mute	AV2 In	AV1 In
					M/H	AV2 In	AV1 In	*[M/H]	L	ON	AV1	AV1	AV2 In	AV1 In	Mute	AV2 In	AV1 In
				AV2	L	AV2 In	AV1 In	L	L	OFF	AV2	AV2	AV2 In	AV1 In	Mute	AV2 In	AV1 In
					M/H	AV2 In	AV1 In	*[M/H]	L	ON	AV2	AV2	AV2 In	AV1 In	Mute	AV2 In	AV1 In
				AV3	L	AV2 In	AV1 In	L	L	OFF	AV3	AV3	AV2 In	AV1 In	Mute	AV2 In	AV1 In
					M/H	AV2 In	AV1 In	*[M/H]	L	ON	AV3	AV3	AV2 In	AV1 In	Mute	AV2 In	AV1 In
				SAT.TU	L	AV2 In	AV1 In	L	L	OFF	SAT	SAT	AV2 In	AV1 In	Mute	AV2 In	AV1 In
					M/H	AV2 In	AV1 In	*[M/H]	L	ON	SAT	SAT	AV2 In	AV1 In	Mute	AV2 In	AV1 In
			H	TUN	L	VCR out	AV1 In	H	H	OFF	TUN	TUN	Mute	Mute	Mute	TUN	AV1 In
					M/H	VCR out	AV1 In	H	H	OFF	TUN	TUN	Mute	Mute	Mute	TUN	AV1 In
				AV1	L	VCR out	AV1 In	H	H	OFF	AV1	AV1	Mute	Mute	Mute	AV1 In	AV1 In
					M/H	VCR out	AV1 In	H	H	OFF	AV1	AV1	Mute	Mute	Mute	AV1 In	AV1 In
				AV2	L	VCR out	AV1 In	H	H	OFF	AV2	AV2	Mute	Mute	Mute	AV2 In	AV1 In
					M/H	VCR out	AV1 In	H	H	OFF	AV2	AV2	Mute	Mute	Mute	AV2 In	AV1 In
				AV3	L	VCR out	AV1 In	H	H	OFF	AV3	AV3	Mute	Mute	Mute	AV3 In	AV1 In
					M/H	VCR out	AV1 In	H	H	OFF	AV3	AV3	Mute	Mute	Mute	AV3 In	AV1 In
				SAT.TU	L	VCR out	AV1 In	H	H	OFF	SAT	SAT	Mute	Mute	Mute	SAT	AV1 In
					M/H	VCR out	AV1 In	H	H	OFF	SAT	SAT	Mute	Mute	Mute	SAT	AV1 In
	DECODER	---	L	TUN	L	AV2 In	AV1 In	L	L	OFF	TUN	TUN	AV2 In	AV1 In	Mute	AV2 In	AV1 In
					M/H	AV2 In	AV1 In	M/H	L	ON	TUN	TUN	AV2 In	AV1 In	Mute	AV2 In	AV1 In
				AV1	L	AV2 In	AV1 In	L	L	OFF	AV1	AV1	AV2 In	AV1 In	Mute	AV2 In	AV1 In
					M/H	AV2 In	AV1 In	M/H	L	ON	AV2	AV2	AV2 In	AV1 In	Mute	AV2 In	AV1 In
				AV2	L	AV2 In	AV1 In	L	L	OFF	AV2	AV2	AV2 In	AV1 In	Mute	AV2 In	AV1 In
					M/H	AV2 In	AV1 In	M/H	L	ON	AV2	AV2	AV2 In	AV1 In	Mute	AV2 In	AV1 In
				AV3	L	AV2 In	AV1 In	L	L	OFF	AV3	AV3	AV2 In	AV1 In	Mute	AV2 In	AV1 In
					M/H	AV2 In	AV1 In	M/H	L	ON	AV3	AV3	AV2 In	AV1 In	Mute	AV2 In	AV1 In
				SAT.TU	L	AV2 In	AV1 In	L	L	OFF	SAT	SAT	AV2 In	AV1 In	Mute	AV2 In	AV1 In
					M/H	AV2 In	AV1 In	M/H	L	ON	SAT	SAT	AV2 In	AV1 In	Mute	AV2 In	AV1 In
			H	TUN	L	VCR out	AV1 In	H	L	OFF	TUN	TUN	Mute	Mute	Mute	TUN	AV1 In
					M/H	VCR out	AV1 In	H	L	OFF	TUN	TUN	Mute	Mute	Mute	TUN	AV1 In
				AV1	L	VCR out	AV1 In	H	L	OFF	AV1	AV1	Mute	Mute	Mute	AV1 In	AV1 In
					M/H	VCR out	AV1 In	H	L	OFF	AV2	AV2	Mute	Mute	Mute	AV2 In	AV1 In
				AV2	L	VCR out	AV1 In	H	L	OFF	AV2	AV2	Mute	Mute	Mute	AV2 In	AV1 In
					M/H	VCR out	AV1 In	H	L	OFF	AV2	AV2	Mute	Mute	Mute	AV2 In	AV1 In
				AV3	L	VCR out	AV1 In	H	L	OFF	AV3	AV3	Mute	Mute	Mute	AV3 In	AV1 In
					M/H	VCR out	AV1 In	H	L	OFF	AV3	AV3	Mute	Mute	Mute	AV3 In	AV1 In
				SAT.TU	L	VCR out	AV1 In	H	L	OFF	SAT	SAT	Mute	Mute	Mute	SAT	AV1 In
					M/H	VCR out	AV1 In	H	L	OFF	SAT	SAT	Mute	Mute	Mute	SAT	AV1 In

INPUT CONDITION						VIDEO OUTPUT RESULT							AUDIO OUTPUT RESULT				
POWER	AV2 SELECT	EE/ VV	OSD ON(H)	INPUT CH	AV2 PB(H)	AV1 OUT	AV2 OUT	AV1 PB(H)	AV2 PB(H)	RGB SW	VCR IN	VCR OUT	AV1 Out	AV2 Out	RF (C)	AV1 Out Selector	AV2 Out Selector
P.ON	EXT	EE	L	TUN	---	VCR out	VCR out	L	L	OFF	TUN	TUN	TUN	TUN	TUN	TUN	INSEL
				AV1	---	VCR out	VCR out	L	L	OFF	AV1	AV1	AV1 In	AV1 In	AV1 In	AV1 In	INSEL
	or			AV2	---	VCR out	VCR out	L	L	ON	AV2	AV2	AV2 In	AV2 In	AV2 In	AV2 In	INSEL
				AV3	---	VCR out	VCR out	L	L	OFF	AV3	AV3	AV3 In	AV3 In	AV3 In	AV3 In	INSEL
	TIMER1			SAT.TU	---	VCR out	VCR out	L	L	OFF	SAT	SAT	SAT	SAT	SAT	SAT	INSEL
			H	TUN	---	VCR out	VCR out	H	H	OFF	TUN	TUN	TUN	TUN	TUN	TUN	INSEL
	or			AV1	---	VCR out	VCR out	H	H	OFF	AV1	AV1	AV1 In	AV1 In	AV1 In	AV1 In	INSEL
				AV2	---	VCR out	VCR out	H	H	OFF	AV2	AV2	AV2 In	AV2 In	AV2 In	AV2 In	INSEL
	TIMER2			AV3	---	VCR out	VCR out	H	H	OFF	AV3	AV3	AV3 In	AV3 In	AV3 In	AV3 In	INSEL
				SAT.TU	---	VCR out	VCR out	H	H	OFF	SAT	SAT	SAT	SAT	SAT	SAT	INSEL
		VV	---	TUN	---	VCR out	VCR out	M/H	M/H	OFF	TUN	PB	PB	PB	PB	TUN	INSEL
				AV1	---	VCR out	VCR out	M/H	M/H	OFF	AV1	PB	PB	PB	PB	AV1 In	INSEL
				AV2	---	VCR out	VCR out	M/H	M/H	OFF	AV2	PB	PB	PB	PB	AV2 In	INSEL
				AV3	---	VCR out	VCR out	M/H	M/H	OFF	AV3	PB	PB	PB	PB	AV3 In	INSEL
				SAT.TU	---	VCR out	VCR out	M/H	M/H	OFF	SAT	PB	PB	PB	PB	SAT	INSEL
	DECODER	EE	L	TUN	L	VCR out	TUN IN	L	L	OFF	TUN	TUN	TUN	TUN	TUN	TUN	TUN
					M/H	VCR out	TUN IN	L	L	ON	AV2	AV2	AV2 In	TUN	AV2 In	AV2 In	TUN
				AV1	L	VCR out	AV1 In	L	L	OFF	AV1	AV1	AV1 In	AV1 In	AV1 In	AV1 In	AV1 In
					M/H	VCR out	AV1 In	L	L	ON	AV2	AV2	AV2 In	AV1 In	AV2 In	AV2 In	AV1 In
				AV2	L	VCR out	AV1 In	L	L	ON	AV2	AV2	AV2 In	AV1 In	AV2 In	AV2 In	AV1 In
					M/H	VCR out	AV1 In	L	L	ON	AV2	AV2	AV2 In	AV1 In	AV2 In	AV2 In	AV1 In
				AV3	L	VCR out	AV1 In	L	L	OFF	AV3	AV3	AV3 In	AV1 In	AV3 In	AV3 In	AV1 In
					M/H	VCR out	AV1 In	L	L	OFF	AV3	AV3	AV3 In	AV1 In	AV3 In	AV3 In	AV1 In
				SAT.TU	L	VCR out	SAT IN	L	L	OFF	SAT	SAT	SAT	SAT	SAT	SAT	SAT
					M/H	VCR out	SAT IN	L	L	ON	AV2	AV2	AV2 In	SAT	AV2 In	AV2 In	SAT
			H	TUN	L	VCR out	TUN IN	H	L	OFF	TUN	TUN	TUN	TUN	TUN	TUN	TUN
					M/H	VCR out	TUN IN	H	L	OFF	AV2	AV2	AV2 In	TUN	AV2 In	AV2 In	TUN
				AV1	L	VCR out	AV1 In	H	L	OFF	AV1	AV1	AV1 In	AV1 In	AV1 In	AV1 In	AV1 In
					M/H	VCR out	AV1 In	H	L	OFF	AV2	AV2	AV2 In	AV1 In	AV2 In	AV2 In	AV1 In
				AV2	L	VCR out	AV1 In	H	L	OFF	AV2	AV2	AV2 In	AV1 In	AV2 In	AV2 In	AV1 In
					M/H	VCR out	AV1 In	H	L	OFF	AV2	AV2	AV2 In	AV1 In	AV2 In	AV2 In	AV1 In
				AV3	L	VCR out	AV1 In	H	L	OFF	AV3	AV3	AV3 In	AV1 In	AV3 In	AV3 In	AV1 In
					M/H	VCR out	AV1 In	H	L	OFF	AV3	AV3	AV3 In	AV1 In	AV3 In	AV3 In	AV1 In
				SAT.TU	L	VCR out	SAT IN	H	L	OFF	SAT	SAT	SAT	SAT	SAT	SAT	SAT
					M/H	VCR out	SAT IN	H	L	ON	AV2	AV2	AV2 In	SAT	AV2 In	AV2 In	SAT
		VV	---	TUN	L	VCR out	TUN IN	M/H	L	OFF	TUN	PB	PB	TUN	PB	TUN	TUN
					M/H	VCR out	TUN IN	M/H	L	OFF	AV2	PB	PB	TUN	PB	AV2 In	TUN
				AV1	L	VCR out	AV1 In	M/H	L	OFF	AV1	PB	PB	AV1 In	PB	AV1 In	AV1 In
					M/H	VCR out	AV1 In	M/H	L	OFF	AV2	PB	PB	AV1 In	PB	AV2 In	AV1 In
				AV2	L	VCR out	AV1 In	M/H	L	OFF	AV2	PB	PB	AV1 In	PB	AV2 In	AV1 In
					M/H	VCR out	AV1 In	M/H	L	OFF	AV2	PB	PB	AV1 In	PB	AV2 In	AV1 In
				AV3	L	VCR out	AV1 In	M/H	L	OFF	AV3	PB	PB	AV1 In	PB	AV3 In	AV1 In
					M/H	VCR out	AV1 In	M/H	L	OFF	AV3	PB	PB	AV1 In	PB	AV3 In	AV1 In
				SAT.TU	L	VCR out	SAT IN	M/H	L	OFF	SAT	PB	PB	SAT	PB	SAT	SAT
					M/H	VCR out	SAT IN	M/H	L	OFF	AV2	PB	PB	SAT	PB	AV2 In	SAT

NOTE: RGB SW : OFF = HIGH, ON=LOW

EE : Non-Playback signal VV:Playback signal

*[M/H] :In case of Personal Planner standby(not External Link), AV1 PB must not output 'M' or 'H'

443NT [L]	4.43 NTSC Ⓛ
A. COMP	AUDIO COMPONENT SIGNAL
A. COMPO	AUDIO COMPONENT SIGNAL
A. D.P [L]	AUDIO DUBBING PAUSE Ⓛ
A. D/L [L]	AUDIO DUBBING PAUSE Ⓛ
A. DEF [S]	AUDIO DEFEAT
A. DEF [S] [L]	AUDIO DEFEAT
A. DUB P [L]	AUDIO DUBBING PAUSE Ⓛ
A. DUB [H]	AUDIO DUBBING Ⓗ
A. ERASE	AUDIO ERASE
A. H. SW	AUDIO HEAD SWITCHING PULSE
A. HEAD [R]	AUDIO HEAD (REC)
A. HEAD [W]	AUDIO HEAD (PLAY)
A. IN [L]	AUDIO INPUT (L)
A. IN [R]	AUDIO INPUT (R)
A. MUT [H]	AUDIO MUTE Ⓗ
A. MUTE [H]	AUDIO MUTE Ⓗ
A. OUT [L]	AUDIO OUTPUT (L)
A. OUT [R]	AUDIO OUTPUT (R)
A. RF OUT	AUDIO RF SIGNAL OUTPUT
A/VS/S. DATA	AV SW/SERIAL DATA
AC ONLINE	AC ONLINE
AC. O/EE. H	AC ONLINE/EE Ⓗ
AFC S C	AFC S CURVE
AFC [S]	AFC S CURVE
AFC. DEF	AFC DEFEAT
ARFC OUT	AUDIO RF SIGNAL OUTPUT
ART. V	ARTIFICIAL VERTICAL SYNC SIGNAL
ART. V. MM	ARTIFICIAL VERTICAL SYNC SIGNAL MONO MULTI
ART. V/H/N	ARTIFICIAL VERTICAL SYNC SIGNAL Ⓗ/NORMAL
AT. V/H/N	ARTIFICIAL VERTICAL SYNC SIGNAL
ATSW/TEST/NOR/SE	TEST/NORMAL/SERVICE
AUDIO IN [L]	AUDIO INPUT (L)
AUDIO IN [R]	AUDIO INPUT (R)
AUDIO OUT [L]	AUDIO OUTPUT (L)
AUDIO OUT [R]	AUDIO OUTPUT (R)
AUDIO SELECT [H]	AUDIO SELECT Ⓗ
AUDIO. L	AUDIO (L)
AUDIO. R	AUDIO (R)
AV CNT	AV CONTROL
AV CTL	AV CONTROL
AV CTL/S. CLK	AV CONTROL/SERIAL CLOCK
AV. C.M.	AV CONTROL MODE
AVCNT/METER. R	AV CONTROL/LEVEL METER (R)
AVSW/METER. L	AV SW/LEVEL METER (L)
B MODE. H	B MODE Ⓗ
B.G.P	BURST GATE PULSE
BACKUP 5V	BACK UP 5V
BAND. U.E.	BAND U
BANDVL. D	BAND VL
BI/MI [L]	BILINGUAL/MIX Ⓛ
BIL	BILINGUAL
BIL [L]	BILINGUAL Ⓛ
BIL. [H]	BILINGUAL Ⓗ
BIL/M1 [L]	BILINGUAL Ⓛ
BS CLOCK	BS CLOCK
BS DATA	BS DATA
BS LCH IN	BS L CHANNEL INPUT
BS MIX [H]	BS MIX Ⓗ
BS MON [H]	BS MONITOR Ⓗ
BS MONI [H]	BS MONITOR Ⓗ
BS RCH IN	BS R CHANNEL INPUT
BS VIDEO	BS VIDEO SIGNAL
BS VIDEO/BS1	BS VIDEO SIGNAL
BS [H]	BS Ⓗ
BS. LEVEL	BS LEVEL
BS. M [H]	BS MONITOR Ⓗ
BS/VTR [H]	BS/VTR Ⓗ
BUS CLK	BUS CLOCK
BUS LSN	BUS LISTEN
BUS TLK	BUS TALK
BUZZER	BUZZER
CAP EC	CAPSTAN TORQUE CONTROL
CAP M GND	CAPSTAN MOTOR GND
CAP. ET	CAPSTAN TORQUE CONTROL
CAP. FG1	CAPSTAN FG1 PULSE
CAP. FG2	CAPSTAN FG2 PULSE
CAS. SW	CASSETTE SW
CCN	PLAYBACK CONTROL SIGNAL (–)
CCP	PLAYBACK CONTROL SIGNAL (+)
CHM	CONTROL SIGNAL (+)
CHP	CONTROL SIGNAL (–)
CINEM [L]	CINEMA Ⓛ
CINEMA [L]	CINEMA Ⓛ
CINEMA/MIX	CINEMA/MIX
CKL	RATCH LOCK
CKS	SHIFT LOCK
CL	CLOCK
CLK	CLOCK
CLK (C.G)	CLOCK
CLOCK. IN	CLOCK INPUT
CLP	CLAMP
COL/B/W/NOR	COLOUR/BLACK & WHITE/NORMAL
COLOR [H]	COLOUR Ⓗ
CONV	CONVERTOR
CS	CHIP SELECT
CTL GND	CONTROL GND
CTL HEAD [+]	CONTROL HEAD (+)
CTL HEAD [–]	CONTROL HEAD (–)
CTL [+]	CONTROL HEAD (+)
CTL [–]	CONTROL HEAD (–)
CUE BIAS	CUE BIAS
CURRENT LIM	CURRENT LIMMITER
CYL ET	CYLINDER TORQUE CONTROL

CYL GND	CYLINDER GND
D.F.M. REC [H]	DELAIED FM RECORDING Ⓗ
D. FM REC [L]	DELAIED FM RECORDING Ⓛ
D. GND	DIGITAL GND
D. REC [H]	DELAYED RECORDING Ⓗ
D4/S. LED	D4/STILL LED
D4/STILLED	D4/STILL LED
DAC [CLK]	TUNER DAC (CLOCK)
DAC/FSCS	TUNER DAC/FS CHIP SELECT
DAREC [H]	DELAYED AUDIO RECORDING Ⓗ
DATA	DATA
DECODER [L]	DECODER (L)
DECODER [R]	DECODER (R)
DEW	DEW
DEW SNS	DEW SENSOR
DFMRE [H]	DELAYED FM AUDIO RECORDING Ⓗ
E. REC 5V	EXCEPT RECORDING 5V
EC	ERROR TORQUE CONTROL
ECR	ERROR TORQUE CONTROL REFERENCE VOLTAGE
EDT TRIG [L]	EDIT TRIGGER Ⓛ
EDIT [H]	EDIT Ⓗ
EE [H]	EE Ⓗ
EE [H]/INS [M]	EE Ⓗ/INSERT Ⓜ
EE. VV. TR	EE/VV/TRICK PLAY
EJECT. PO	EJECT POSITION
EJECT/VDET	EJECT/REVERSE SLOW LOCK
ENV. SEL	ENVELOPE SELECT
ENVE. OUT	ENVELOPE OUTPUT
ENVE. SEL	ENVELOPE SELECT
ENV SELECT	ENVELOPE SELECT
EP [H]	LP Ⓗ
EP/LP [H]	LP Ⓗ
EP/LP/SP	LP/SP
EP/SS [H]	LP/SLOW/STILL/STOP Ⓗ
EPROMCS	EPROM CHIP SELECT
EX. REC 5V	EXCEPT RECORDING 5V
FF/REW [L]	FIRST FORWARD/REWIND Ⓛ
FG1 IN	FG1 PULSE INPUT
FG2 IN	FG2 PULSE INPUT
FILTER ADJUSTMENT	FILTER ADJUSTMENT
FLY ERASE [H]	FLYING ERASE HEAD ON Ⓗ
FLY ON [H]	FLYING ERASE HEAD ON Ⓗ
FLY. E [H]	FLYING ERASE HEAD ON Ⓗ
FM MUT [H]	FM AUDIO MUTE Ⓗ
FM MUTE [H]	FM AUDIO MUTE Ⓗ
FM OUT [L]	FM OUTPUT (L)
FM OUT [R]	FM OUTPUT (R)
FM PACK OUT [L]	FM PACK OUTPUT (L)
FM PACK OUT [R]	FM PACK OUTPUT (R)
FM/BS SEL [L]	FM/BS SELECT (L)
FM/BS SEL [R]	FM/BS SELECT (R)
FS. CLK	FS CLOCK
FUL. E [H]	FULL ERASE HEAD ON Ⓗ
FULL. E [H]	FULL ERASE HEAD ON Ⓗ

FULL. E. 12V	FULL ERASE 12V
GND [A]	GND (ANALOG)
GND [TU]	GND (TUNER)
GND/N. SW. 12V	GND/NON SW 12V
H. SYNC	HORIZONTAL SYNC
H. AMP. SW	HEAD AMP SW PULSE
H. P <R>	HEAD PHONE (R)
H. P <L>	HEAD PHONE (L)
H. P GND	HEAD PHONE GND
H. P OUT [L]	HEAD PHONE OUTPUT (L)
H. P OUT [R]	HEAD PHONE OUTPUT (R)
H. SW	HEAD SW PULSE
HEAD PHONE [L]	HEAD PHONE (L)
HEAD PHONE [R]	HEAD PHONE (R)
HEAD SW	HEAD SW
HEATER [+]	HEATER (+)
HEATER [–]	HEATER (–)
HSS	HORIZONTAL SYNC SIGNAL
HTR [+]	HEATER (+)
HTR [–]	HEATER (–)
I RFE	REFERENCE CURRENT
ICL	CONTROL AGC CIRCUIT
IF	INTERMEDIATE FREQUENCY
IN SELA1	INPUT SELECT A1 POSITION
IN SELA2	INPUT SELECT A2 POSITION
IN SELA3	INPUT SELECT A3 POSITION
INS L/R [L]	INSERT Lch/Rch Ⓛ
INS. [H]	INSERT Ⓗ
INSEL A1	INPUT SELECT A1 POSITION
INSEL A2	INPUT SELECT A2 POSITION
INSERT	INSERT
INSERT [H]	INSERT Ⓗ
IO CS	INPUT/OUTPUT CHIP SELECT
JOG1	JOG1
JOG S3 LED/FOWRD	JOG LED/FORWARD LED
JOG/F. LED	JOG LED/FORWARD LED
JSB [H]	JSB Ⓗ
JST. CLCK	JUST CLOCK
JST. CLK	JUST CLOCK
JST. CLOCK	JUST CLOCK
L. OUT	Lch OUTPUT
L. CH [H]	Lch Ⓗ
L. CH [L]	Lch Ⓛ
LED (MAIN)	LED (MAIN)
LED (STEREO)	LED (STEREO)
LED (SUB)	LED (SUB)
LED CKL	LED SERIAL CLOCK
LED CKS	LED SERIAL CLOCK
LED DATA	LED SERIAL DATA
LINE IN 1 [L]	LINE INPUT 1 (L)
LINE IN 1 [R]	LINE INPUT 1 (R)
LINE IN 2 [L]	LINE INPUT 2 (L)
LINE IN 2 [R]	LINE INPUT 2 (R)
LINE IN V	LINE INPUT VIDEO
LINE IN [L]	LINE INPUT (L)

LINE IN [R]	LINE INPUT (R)
LINE OUT [L]	LINE OUTPUT (L)
LINE OUT [R]	LINE OUTPUT (R)
LP [H]	LP Ⓗ
LPTRI [L]	LP TRICK PLAY Ⓛ
Lch/A. DUB	Lch/AUDIO DUBBING
M GND	MOTOR GND
M REG	MOTOR REGULATOR
MAIN OUT	MAIN OUTPUT
MAIN [L]	MAIN Ⓛ
MAIN/MONO	MAIN/MONAURAL
MAX IN	MAXIMAM INPUT
MES [H]	MESECAM Ⓗ
MESE [H]	MESECAM Ⓗ
MESE [L]	MESECAM Ⓛ
METER 5V	LEVEL METER 5V
METER [L]	LEVEL METER (L)
METER [R]	LEVEL METER (R)
METER. L/AVS	LEVEL METER (L)
METER. R/AVC	LEVEL METER (R)
MI/BI [L]	MIX Ⓗ/BILIGUAL
MIC GND	MIC GND
MIC IN	MIC INPUT
MIC IN [L]	MIC INPUT (L)
MIC IN [R]	MIC INPUT (R)
MIC [H]	MIC Ⓗ
MIX [H]	MIX Ⓗ
MIX [H]/CINEMA [L]	MIX Ⓗ/CINEMA SOUND Ⓛ
MIX/CINE	MIX Ⓗ/CINEMA SOUND Ⓛ
MIX/CINEMA [L]	MIX Ⓗ/CINEMA SOUND Ⓛ
MN. H/M. L	MONAURAL Ⓗ/MAIN Ⓛ
MN. H/MAI. L	MONAURAL Ⓗ/MAIN Ⓛ
MN2/MES. L	MONAURAL 2/MESECAM Ⓛ
MODE SEL	AUDIO MODE SELECT
MODE SW	AUDIO MODE SW
MODE. S. IN	AUDIO MODE SELECT INPUT
MODE. S. OUT	AUDIO MODE SELECT OUTPUT
MONO [H]	MONAURAL Ⓗ
MONO [H]/MAIN [L]	MONAURAL Ⓗ/MAIN Ⓛ
MONO2 [L]	MONAURAL 2
MONO2/MESE [FM(L)]	MONAURAL 2/MESECAM (FM Ⓛ)
MOTOR GND	MOTOR GND
MUTE	MUTE
N. A. REC [L]	NORMAL AUDIO RECORDING
N. SW 12V	NON SW 12V
N. SW. 5. DET	NON SW 5V DETECT
NICAM	NICAM
NICAM [L]	NICAM Ⓛ
NOL [H]	PAL Ⓗ/4.43 NTSC Ⓜ/3.58 NTSC Ⓛ
NOR/SOFT [H]	NORMAL/SOFT TAPE PLAY Ⓗ
NORMAL [H]	NORMAL Ⓗ
NR BIAS	NR BIAS
NTSC [L]	NTSC Ⓛ
OCH	CONTROL AGC CIRCUIT
OUT	OUTPUT

P-OFF [H]	POWER OFF Ⓗ
P-OFF [L]	POWER OFF Ⓛ
P. FAIL	POWER FAILURE DETECT
P. OFF [H]	POWER OFF Ⓗ
P. OFF [L]	POWER OFF Ⓛ
PAL [H]	PAL Ⓗ
PAL [L]/NTSC [H]	PAL Ⓛ/NTSC Ⓗ
PB ADJ OUT	PLAYBACK ADJUST OUTPUT
PB OUT	PLAYBACK OUTPUT
PB. H	PLAYBACK Ⓗ
PFG	PG/FG
PHOTSN +B	PHOTO SENSOR +B
PICT. CNT	PICTURE CONTROL
PLAY LED/RVS LED	PLAY LED/REVERSE LED
PLAY. PO	PLAY POSITION
PLAY/R. LED	PLAY LED/REVERSE LED
PLY/DEW	PLAY/DEW Ⓗ
POWER OFF [L]	POWER OFF Ⓛ
PREROLL [H]	PREROLL Ⓗ
PWRFAIL	POWER FAILURE DETECT
R. CH [H]	Rch Ⓗ
R. CH [L]	Rch Ⓛ
R. ST	RESET
R/S/F	REVERSE Ⓗ/STOP Ⓜ/FORWARD Ⓛ
RCH [H]	Rch Ⓗ
REC 12V	RECORDING 12V
REC CHROMA	RECORDING CHROMINANCE SIGNAL
REC H	RECORDING Ⓗ
REC IN	RECORDING INPUT
REC OUT [L]	RECORDING OUTPUT Ⓛ
REC START	RECORDING START
REC VR [C]	RECORDING VOLUME (COMMON)
REC VR [L]	RECORDING VOLUME (L)
REC VR [R]	RECORDING VOLUME (R)
REC Y	RECORDING LUMINANCE SIGNAL
REC [H]	RECORDING Ⓗ
REC. C	RECORDING CHROMINANCE SIGNAL
REC. Y	RECORDING LUMINANCE SIGNAL
REC/EE CTL	RECORDING/EE CONTROL
REEL-T	REEL PULSE (TAKE-UP)
REEL-S	REEL PULSE (SUPPLY)
REGULATOR FILTER	REGULATOR FILTER
RESET	RESET
REV M F/R	REVIEW MOTOR FORWARD/REVERSE
REV M V1	REVIEW MOTOR V1
REV M V2	REVIEW MOTOR V2
REV MOTOR F/R	REVIEW MOTOR FORWARD/REVERSE
REV MOTOR V1	REVIEW MOTOR V1
REV MOTOR V2	REVIEW MOTOR V2
REV MOTOR [+]	REVIEW MOTOR (+)
REV MOTOR [–]	REVIEW MOTOR (+)
REV. M. GND	REVIEW MOTOR GND
RF. CHROMA	RF CHROMINANCE SIGNAL

RF OUT	RF OUTPUT
RF Y	RF LUMINANCE SIGNAL
RF. Y. IN	RF LUMINANCE SIGNAL INPUT
RF. Y. OUT	RF LUMINANCE SIGNAL OUTPUT
ROTAR. SW	ROTARY SW
ROTARY	ROTARY SW
RST	RESET
RST [L]	RESET Ⓛ
Rch/INST	Rch/INSERT
S IN	SERIAL DATA INPUT
S OUT	SERIAL DATA OUTPUT
S-PHOTO	SUPPLY PHOTO TRANSISTOR
S-RL. PLS	SUPPLY REEL PULSE
S. CLK	SERIAL CLOCK
S. CLK/AV	SERIAL CLOCK/AV
S. DATA	SERIAL DATA
S. DATA/A	SERIAL DATA
S. PHOTO	SUPPLY PHOTO TRANSISTOR
S. TAB [L]	SAFETY TAB SW ON Ⓛ
S/P/N	SECAM/PAL/NTSC
SC IN	SERIAL CLOCK INPUT
SC OUT	SERIAL CLOCK OUTPUT
SCK SELECT	SERIAL CLOCK SELECT
SEL OUT [L]	SELECT OUTPUT (L)
SEL OUT [R]	SELECT OUTPUT (R)
SHUTTLE 1	SHUTTLE 1
SIF	SOUND INTERMEDIATE FREQUENCY
SLMUT [H]	INPUT SELECT MUTE Ⓗ
SLNID [+]	SOLENOID (+)
SLNID [–]	SOLENOID (–)
SLW TR. MM	SLOW TRACKING MONO MULTI
SLW TR. REF	SLOW TRACKING REFERENCE VOLTAGE
SNS. GND	SENSOR GND
SOFT [H]	SOFT TAPE PLAY Ⓗ
SOFT [H]/NORMAL	SOFT TAPE PLAY Ⓗ/NORMAL Ⓗ
SOLENOID ON [L]	SOLENOID ON Ⓛ
SP [H]	SP Ⓗ
SP/L/SLP	SP/LP
SSS [L]	SLOW/STILL/STOP
STEREO LED	STEREO LED
STEREO [H]	STEREO Ⓗ
STEREO [L]	STEREO Ⓛ
STOP. PO	STOP POSITION
STOP/5V	STOP POSITION/5V
STOP1/TAPE SEL	STOP1 POSITION/TAPE SELECT
STOP1/PAL:ST	STOP1 POSITION/PAL
STOP2. PO	STOP 2 POSITION
STOP2/S-TAB	STOP 2 POSITION/SAFETY TAB SW
STREO [H]	STEREO Ⓗ
SUB BIAS	SUB BIAS
SUB. SW	SUB SW
SVHS CAS [L]	S-VHS CASSETTE Ⓛ
SW. 5. DET	SW 5V DETECT
SYNC [L]	SYNC Ⓛ
SYSCON 5V	SYSTEM CONTROL 5V
SYSTEM	SYSTEM SW
T-PHOTO	TAKE-UP PHOTO TRANSISTOR
T-RL. PLS	TAKE-UP REEL PULSE
T. BUSCLK	TIMER BUS CLOCK
T. BUSLSN	TIMER BUS LISTEN
T. BUSTLK	TIMER BUS TALK
T. END [L]	TAPE END Ⓛ
T. PHOTO	TAKE-UP PHOTO TRANSISTOR
TAPE END [L]	TAPE END Ⓛ
TAPE END [L]/CAM	TAPE END Ⓛ/CAMERA PAUSE
TEST	TEST MODE
TPZ	TRAPEZOIDAL WAVE CIRCUIT
TRIC [L]	TRIC PLAY Ⓛ
TRICK [L]	TRIC PLAY Ⓛ
TRK. ENV	AUTO TRACKING ENVELOPE DETECT
TU. AUDIO	TUNER AUDIO
TU. GND	TUNER GND
TU. V. IN	TUNER VIDEO SIGNAL INPUT
TU. VIDEO	TUNER VIDEO
TUN NOR IN	TUNER NORMAL INPUT
TUN R	TUNER AUDIO (R)
TUN. AUDIO IN	TUNER AUDIO INPUT
TUNER 12V	TUNER 12V
TUNER L	TUNER AUDIO (L)
TUNER V IN	TUNER VIDEO SIGNAL INPUT
TUNER [L]	TUNER AUDIO (L)
TUNER [N]	TUNER AUDIO (NORMAL)
TUNER [R]	TUNER AUDIO (R)
TUNER. 12	TUNER 12V
TUOFF [H]	TUNER OFF Ⓗ
TV. AUDIO	TV AUDIO
TV/VTR	TV/VTR
TXTON [L]	TEXT ON Ⓛ
U. REG45V	UNREGULATOR 45V
UNREG	UNREGULATOR
UNREG19V	UNREGULATOR 19V
V. REF	REFERENCE VOLTAGE
V. EE [H]	VIDEO EE Ⓗ
V. EE [L]	VIDEO EE Ⓛ
VCO REF	REFERENCE OSCILLATER
VD. IN	VIDEO SIGNAL INPUT
VD. OUT	VIDEO SIGNAL OUTPUT
VIDEO EE [L]	VIDEO EE Ⓛ
VIDEO IN	VIDEO SIGNAL INPUT
VIDEO OUT	VIDEO SIGNAL OUTPUT
VM	MOTOR VOLTAGE
VM DOWN [L]	MOTOR VOLTAGE DOWN Ⓛ
VSS	VERTICAL SYNC SIGNAL
VTR [H]	VTR Ⓗ
VTR. 12V	VTR 12V
X IN	OSCILLATOR INPUT
X OUT	OSCILLATOR OUTPUT

For your safety please read the following text carefully

This appliance is supplied with a moulded three pin mains plug for your safety and convenience.

A 5 amp fuse is fitted in this plug.

Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5 amps and that it is approved by ASTA or BSI to BS 1362.

Check for the ASTA mark or the BSI mark on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.

If you lose the fuse cover the plug must not be used until a replacement cover is obtained.

A replacement fuse cover can be purchased from your local Panasonic Dealer.

IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY.

THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13 AMP SOCKET.

If a new plug is to be fitted please observe the wiring code as shown below.

If in any doubt please consult a qualified electrician.

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:

Blue: Neutral

Brown: Live

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

Under no circumstance should either of these wires be connected to the earth terminal of the three pin plug, marked with the letter E or the Earth Symbol ⏚.

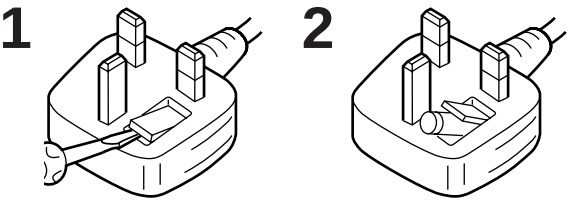
How to replace the Fuse

- There are two types of the AC Mains Lead assembly: **A** and **B** as shown below.

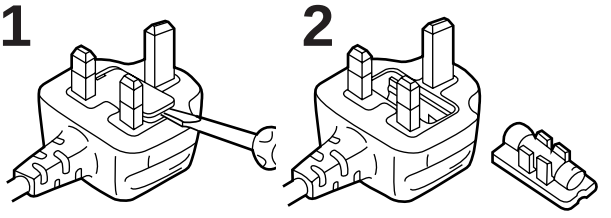
1 Open the fuse compartment with a screwdriver.

2 Replace the fuse and fuse cover.

TYPE A



TYPE B



IC0201 (CAPSTAN MOTOR DRIVE)

CAPSTAN MOTOR L0201

TL0201

MOTOR DRIVE

DIFFERENTIAL AMPRIFIER

TORQUE CONTROL

TL AMP

EC AMP

POSITION SIGNAL PROCESS

TORQUE DIRECTION

CONTROL LOGIC

H1

H2

H3

LOADING MOTOR

P1501 1

P1501 2

P2501 P0201 9

P2501 P0201 8

INPUT		OUTPUT		MODE
PIN 15	PIN 16	PIN 19	PIN 21	
H	L	H	L	FORWARD
L	H	L	H	REWIND
H	H	L	L	BRAKE
L	L	OPEN	OPEN	STOP

R0206 CAPSTAN FG HEAD

CAP FG5V

P0201 P2501 4

TW2015

TW2002

TL2503

TL2502

P0201 P2501 1

P0201 P2501 2

P0201 P2501 3

P0201 P2501 12

P0201 P2501 11

REG 14V

IC6001 (SYSTEM CONTROL/SERVO IC)

1 CURRENT LIMIT

79 CAPSTAN ERROR TORQUE

83 CAPSTAN REVERSE/ FORWARD

67 LOADING Ⓗ

66 UNLOADING Ⓗ

104 CAPSTAN FG IN

103 CAPSTAN FG OUT

114 CTL OUT

69 EX.FF/REW Ⓛ

20MHz IN 31

20MHz OUT 32

32KHz IN 34

32KHz OUT 35

X6002

X6001

FIP Ⓛ 48

BACK UP 5V 33

P.FAIL Ⓛ 76

RESET Ⓛ 52

IR 77

S.DATA IN 90

S.DATA OUT 91

S.CLOCK 89

FIP CS 92

POWER SW 43

IC7504

RESET

N.SW 5V

IC7502

IR RECEIVER

IC7503

RESET

N.SW 5V

C7507

QR1001

DP7501

TIMER DISPLAY

F+ 1

F+ 2

F- 44

F- 45

39

33

23

5

Q1001

BUFFER

FROM POWER

HEATER(+)

HEATER(-)

UNREG -29V

Q1006

IC7501

36 SEG1

18 SEG18

11 GRID1

17 GRID7

19 VEE

1 SERIAL DATA

2 SERIAL CLOCK

3 CS

CYLINDER STATOR UNIT

P2901

6,7	VM	P2501-3,4	MAIN COIL 2
1	M2	P2501-9	MAIN COIL 1
9	M1	P2501-1	MAIN COIL 3
3	M3	P2501-7	
5	GND	P2501-5	
8	HE-	P2501-2	
4	HE+	P2501-6	
2	VH+	P2501-8	

HALL IC

REG 14V

REG 5V

IC2501 (CYLINDER MOTOR DRIVE)

MOTOR DRIVE

PG/FG

DIFFERENTIAL AMPLIFIER

SCHMIT

TORQUE CONTROL

107 CYL PFG

80 CYLINDER ERROR TORQUE

S1501 MODE SW

45 POSITION SW2

44 POSITION SW3

46 POSITION SW1

N.SW 5V

14 TAKE-UP PHOTO

13 SUPPLY PHOTO

65 SAFETY TAB Ⓛ

Q1501 TAKE UP PHOTO SENSOR

D1501 SENSOR LED

Q1502 SUPPLY PHOTO SENSOR

S7507 SAFETY TAB SW

IC1501 (T-REEL SENSOR)

IC1502 (S-REEL SENSOR)

REG 5V

TL6013

TL6012

94 S-REEL PULSE

93 T-REEL PULSE

CTL HEAD

P4003 5

P4003 6

111 CTL HEAD (-)

112 CTL HEAD (+)

N.SW 5V

POWER S7506

EJECT S7505

EXT LINK S7508

5 A2

FF S7514

T.REC S7513

STOP S7515

REC S7501

CH DOWN S7502

6 A5

REW S7512

PLAY S7511

PAUSE S7503

CH UP S7504

7 A4

MAIN SIGNAL PATH IN REC MODE

MAIN SIGNAL PATH IN PLAYBACK MODE

TO/FROM SYSTEM CONTROL

Y/C VIDEO OUT

VIDEO OUT

TO TUNER

RFC VIDEO OUT

FROM TV DEMODULATOR

TUNER VIDEO

Q4904

AMP

(C/D)

IC4901

CLAMP

CLAMP

TO SYSTEM CONTROL

C SYNC

JK4903 (AV1) TV

8 PB +12V

7 BLUE

11 GREEN

15 RED

16 BLANKING

19 VIDEO OUT

20 VIDEO IN

(A/B)

TW3002

TW3003

CLAMP

18

34

33 PB Ⓗ

FROM SYSTEM CONTROL

ART V/H/N

(C/D)

JK4902 (AV2) DECODER/EXT

8 PB +12V

7 BLUE

11 GREEN

15 RED

16 BLANKING

19 VIDEO OUT

20 VIDEO IN

PS12V

Q4903

26

28

CLAMP

Q4901

QR4903

FROM SYSTEM CONTROL

AV1 PB Ⓗ

16 RGB OFF Ⓗ

PS 12V

TO/FROM SYSTEM CONTROL

SYS IIC CLOCK

SYS IIC DATA

TO/FROM SYSTEM CONTROL

OSD IIC DATA

OSD IIC CLOCK

2

3

IIC BUS INTERFACE

IC3001

IC3501

YNR
HSS
1H DELAY
LPF
NC1
PICT
DDC
NOR
CLP1
DET
NC2
AGC
EE
VV
FAMI
Y/C
C
Y
EE/ FAMI
MAIN LPF
NLE NLDE
DTE
ENV DET
PEAKING
H-TRAP
SUB LPF
FM DEM
DOUB LIM
Y/C MIX
REC-Y ADJ
LPF
TW3030
TW3001
AMP & H.AMP SW
PREAMP & H.SW
L
COM
R
P3502 3
P3502 2
P3502 1
TO/FROM CYLINDER VIDEO HEAD
HEAD SW
D.REC Ⓗ
LP Ⓗ
TRACKING ENV.
TO/FROM SYSTEM CONTROL
AGC DET
RF AGC
L-TRAP &HPF
W/D CLIP
MAIN EMPH
DEV ADJ
FM MOD
AMP
ART SYNC
SUB CLAMP
COLOUR KILLER SW
BURST UP/DOWN
630KHz BPF
CACC
REC-C ADJ
BPF (FAMI)3.58M (PAL-PB)2.2M (NTSC-PB) 1.79M
BPF 3.58M/ 4.43M
VV/ FAMI
FAMI/VV
BM-B (PB)2.2/1.79M → 4.43/3.58M (FAMI)2.2M → 4.43M
NTSC ALTERNATION
FSC
TO SYSTEM CONTROL
PHASE ROTATION
2HDL 1HDL
0HDL
0HDL
BM-A (REC)4.43/3.58M (PB)630K → 2.2/1.79M (FAMI)3.58M → 2.2M
ACC
ACC DET
IIC BUS TRANSCEIVER
X2
2fsc
fsc
VXO
1/2
1/4
1/4
SUB BM
F.DET
VCO
1/40
APC CK DET
AFC
SIDE LOCK
PB Q ADJ
FH
VV LP
FAMI/ VV SP
X3001
ROTARY SW
F. ADJ.
FROM SYSTEM CONTROL

FAMI MODE:When setting the NTSC CONVERTER to ON on the OSD Screen Display, the signals from NTSC Signal Source (ex.NTSC GAME Machine)connected to the VCR can be appeared on the PAL TV.However when recording, it is not recorded correctly.

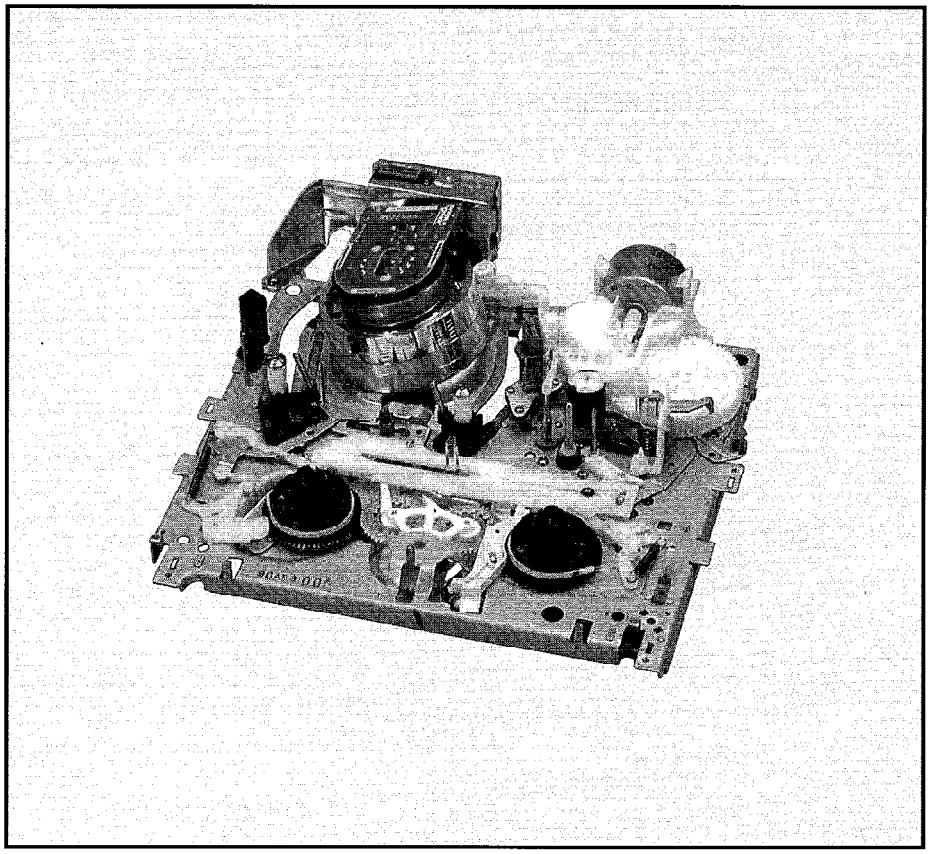
ORDER NO. VRD9612M129

Service Manual

Video Cassette Recorder

Panasonic VHS

Z-MECHANISM CHASSIS



INTRODUCTION

The Z-Mechanism chassis are built in several Panasonic VHS Video Cassette Recorders from NV-SD series in 1996.

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic

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1. OUTLINE OF Z MECHANISM

1-1. The tape transport path

(1) Mechanism Chassis

Aluminium Chassis has been changed to sheet metal (Thickness: 1.2 mm).

(2) Capstan position (Cassette-in method/Capstan-in method)

The Tape does not touch the Cassette tape so that the rationalization has been promoted such as Reel gear pinch up/down mechanism has been deleted.

(3) Deletion of P1 post

FE Head has been installed Limiter so that P1 post has been deleted.

(4) A/C Head base combined with P4 post

A/C Head has been combined with P4 post on the same base.

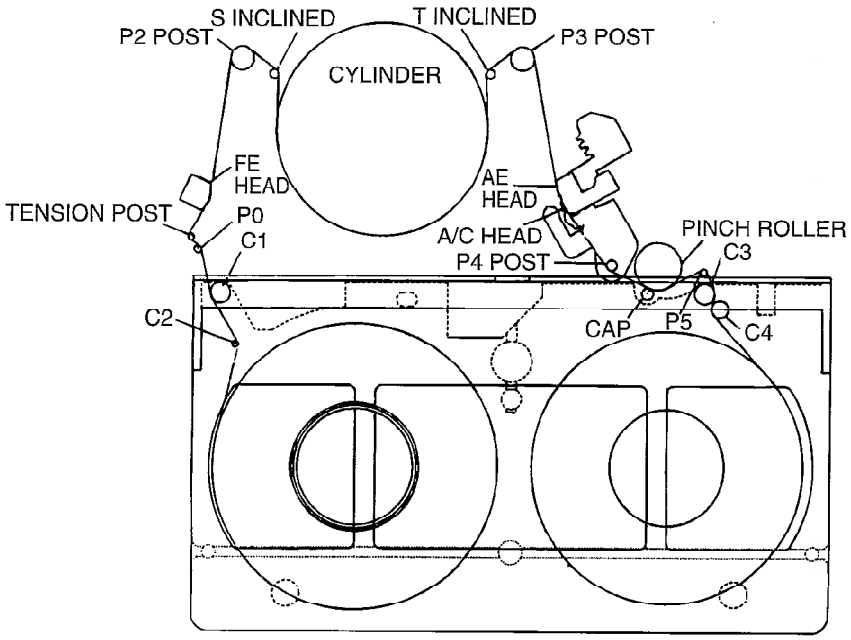
(5) Change of A/C head base type

The change of the angle winding the tape on A/C head has been reduced by the construction of A/C head base has been changed from the revolution type to slide base type.

(6) Improvement of P5 post

P5 post operation has been changed by non-adjustable of the Height and the Tilt adjustment so that the specification has been improved.

Z Mechanism tape transport path in REV mode



1-2. Cassette holder unit

(1) Cassette-in operation

The Rack drive arm drives Main Cam gear by inserting the cassette tape. Consequently, Position switch detects the cassette-in mode so that Loading motor drives. The mode goes to the Stop mode from the Cassette-in through the Loading mode.

① The parts quantity reduction of Cassette holder unit.
(Z Mechanism: 21 pieces, K Mechanism: 36 pieces)
a. Release lever has been installed in Right Side Plate.
b. Cassette guide has been installed in Front Panel unit.
c. Safety lever spring is made by the resin.
d. Opener lever has been changed into the single opener type.
e. One side of Side Plate unit is hung on Chassis in order to fix it.

② Improvement of the cassette insertion
(The force of the cassette insertion Z Mechanism: Approximately 400gm.,
K Mechanism: Approximately 600gm.)
The tooth pitch of Worm gear which has been extended against the previous model, is located on the Motor so that Worm gear can be reversed. Consequently, the Motor rotates before the insertion spring (the combined spring) is working when the cassette tape is inserted, so that the repelled force of the insertion spring has been reduced as differing from the present model.

③ Small-sized Cassette holder unit (Thinned unit)
a. The Wiper arm method which has been adopted, assigned Wiper arm between Cassette Holder Plate and Side Plate so that the small-sized of the width has been realized.
b. To prevent the increment of parts quantity such as Safety lever is used for Pre-open mechanism shown in the present model, and the small-sized unit has been realized by inclining one portion of the L groove in Side Plate.
c. The part of driving change-over is located in the nearest to the center of Reel so that the depth size is compacter.

1-3. Reel brake

(1) Supply Reel Brake is used for Tension Regulator which is composed of the conventional Main brake and the soft brake function.

(2) Take-up Reel Brake is used as Band Brake unit in order to correspond with Supply Reel Brake.

※ Tension Regulator performance:
This is composed of Tension regulator and brake. The tape always is given the tension against the advance direction by Tension band.

(3) Construction of Supply reel tension regulator
Comparison of the construction with the conventional model

	Z Mechanism	K Mechanism
Tension Arm Shaft Bearing construction	Resin	Tension arm
Tension Band	Felt less Lumiller	Felt Lumiller
Braking method	Tension regulator	Main & soft brake

Operating mode and necessary function

Mechanism mode	Necessary function	Operation
Cassette down	Prevention of the tape slag (Soft brake)	Soft brake
Completion of Loading	Prevention of the tape slag (Soft brake)	Tension regulator
REV	Prevention of in Play mode to REV mode (Soft brake)	Tension regulator
PLAY, FF	Back tension adjustment	Same as the conventional
STOP	Main brake function	Tension regulator

(4) Construction of Take-up brake

Take-up brake is used Band brake as well as Supply brake depend on corresponding with Band brake is adopted at the Supply Side.

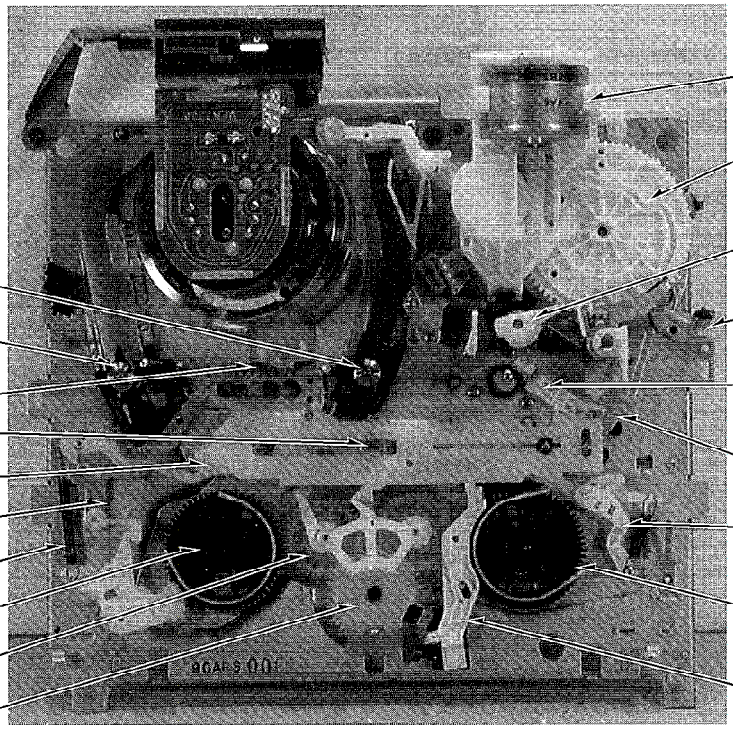
Mechanism mode	Function	Band
EJECT-MID	Soft brake	On
REV	Soft brake	On
PLAY	Release of brake	Off
STOP	Brake	On
FF/REW	Release of brake	Off

1-4. Number of Gear Phase Alignment Point and Replacement Parts

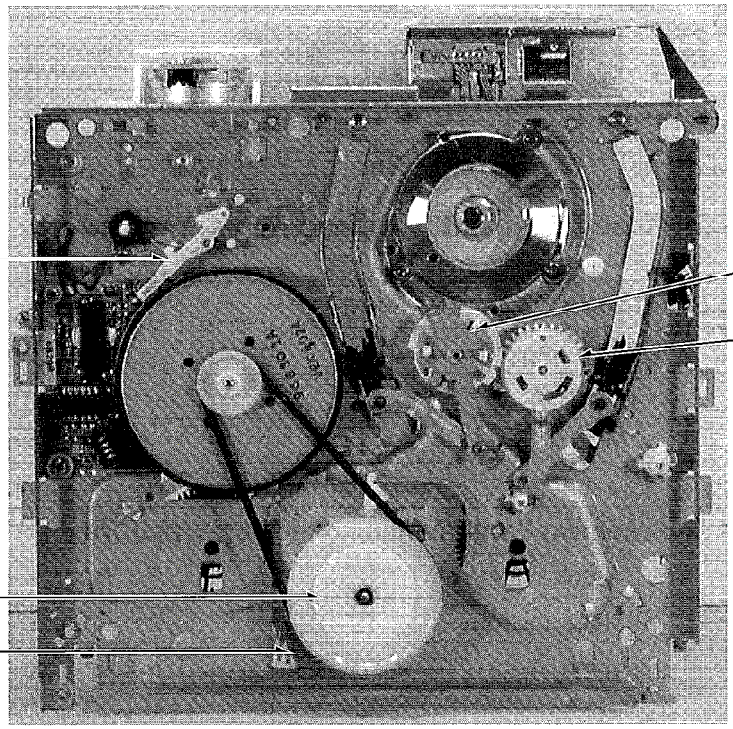
Number of Gear Phase Alignment Point	
G2 Mechanism	12 Alignment Points
G Mechanism	12 Alignment Points
K Mechanism	6 Alignment Points
Z Mechanism	4 Alignment Points
Number of Replacement Parts (including the Screw and Washer)	
G2 Mechanism	Approx.170 Pieces
G Mechanism	Approx. 150 Pieces
K Mechanism	Approx. 100 Pieces
Z Mechanism	Approx. 70 Pieces

Z Mechanism Components

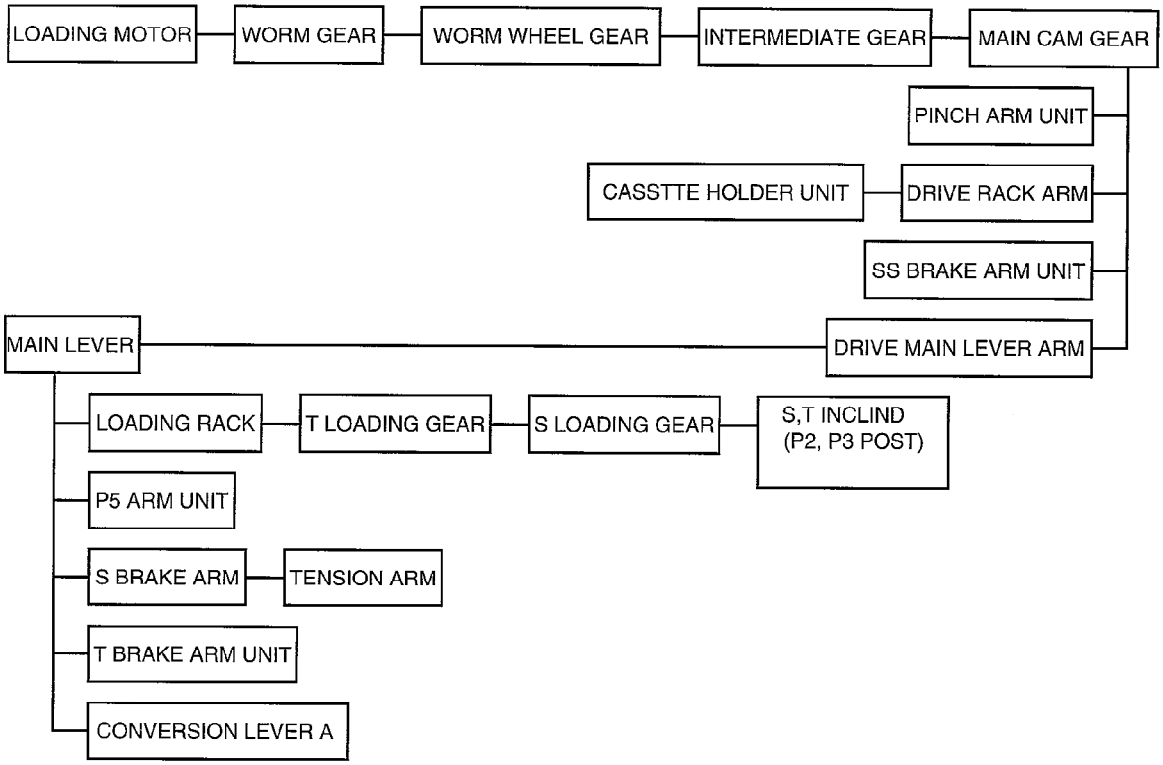
TOP VIEW

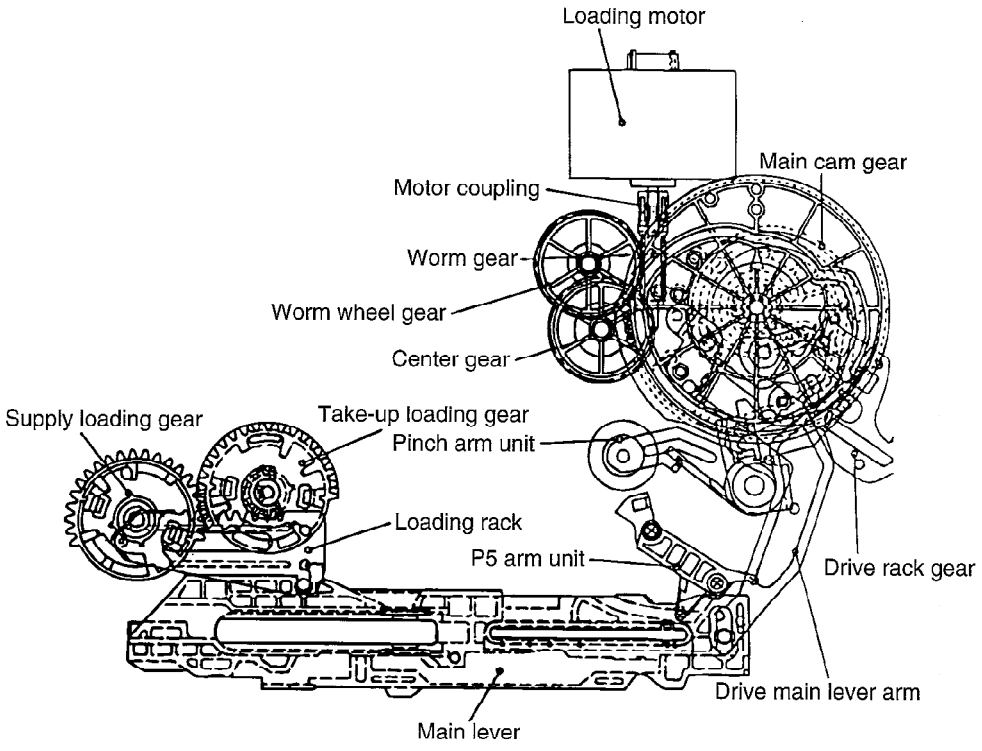


BOTTOM VIEW



FLOW CHART OF LOADING MECHANISM





2. REMOVAL OF CASSETTE TAPE

There are 2 ways to remove a cassette tape.

2-1. Removal of compulsory loading

(1) Press FF, REW and EJECT buttons simultaneously and set the Service Mode 7

(2) Press STOP button in order to unload the mechanism. (Pay an attention of tape slag)
Service Mode Indication :
7 ※※ ※※ (STOP)→7 00 ※※ (EJECT)

2-2 Removal of manual operation of Main cam gear

(1) Disconnect the AC power cord and remove Top Panel.

(2) Rotate Main cam gear to the clockwise and unload the mechanism (Tape is remaining) (Fig. A1).

TOP VIEW

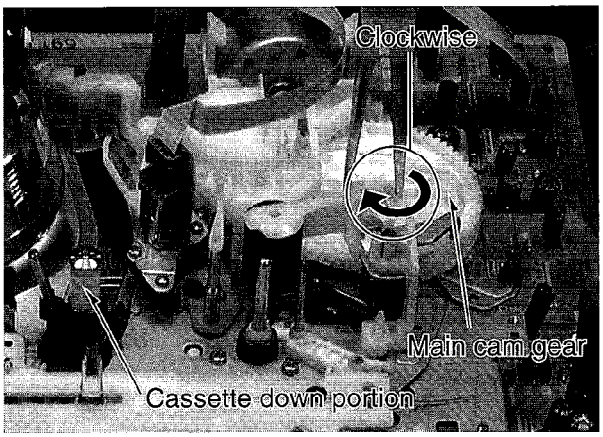


Fig. A1

(3) Rotate the Pole of Capstan motor to the clockwise from the bottom in order to remove the tape slag (Fig. A2).

BOTTOM VIEW

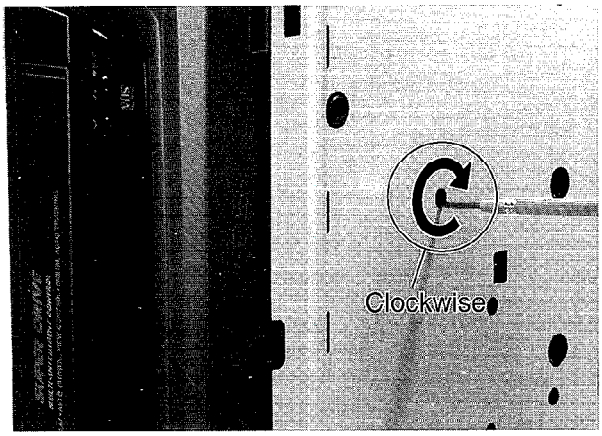


Fig. A2

(4) Rotate Main cam gear to the clockwise in order to eject the cassette tape.

3. REMOVAL OF CASSETTE HOLDER UNIT & MECHANISM CHASSIS

3-1. Removal of Cassette holder unit

(1) Remove Top panel and Front panel unit (Fig. B1)

TOP VIEW

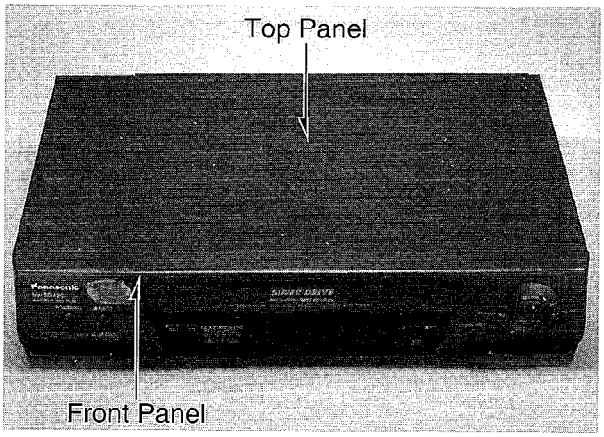


Fig. B1

(2) Remove Top plate

Remove 4 tabs fixing Top plate and remove Top plate (Fig. B2).

※ 4 Tabs should be removed softly duc to they are fragile.

TOP VIEW

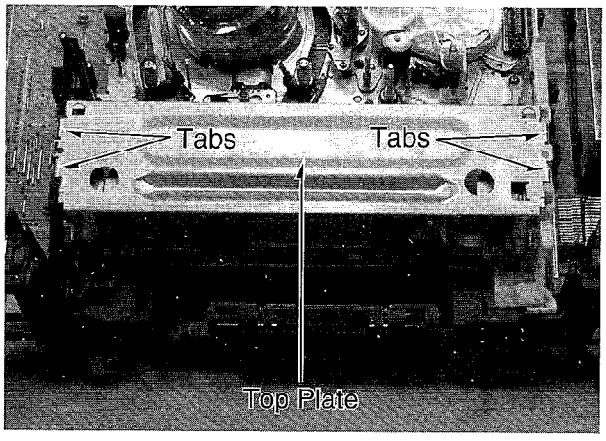


Fig. B2

(3) Remove Casscttc Holder Plate

Keep pressing 2 stoppers on Cassette holder Plate and Press Cassette holder plate to the rear and remove it from Left and Right Side Plate (Fig. B3).

TOP VIEW

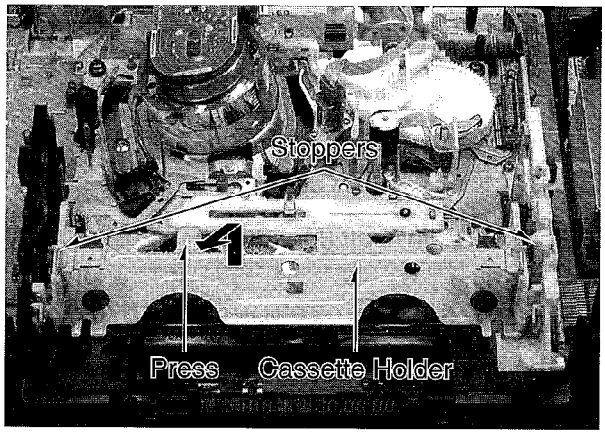


Fig. B3

(4) Remove Left and Right Side Plate

Remove Conjuction spring of Drive gear.

Remove 3 red screws, 3 tabs and remove Left and Right Side Plate (Fig. B4, B5).

TOP VIEW

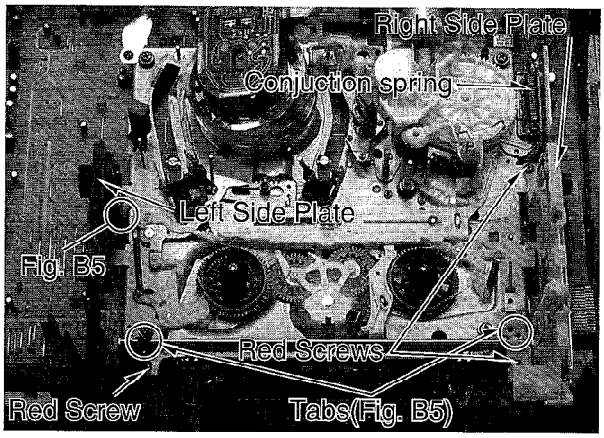


Fig. B4

TOP VIEW

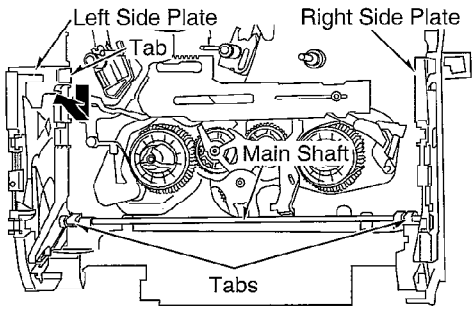


Fig. B5

(5) Remove Main shaft (Fig. B6)

TOP VIEW

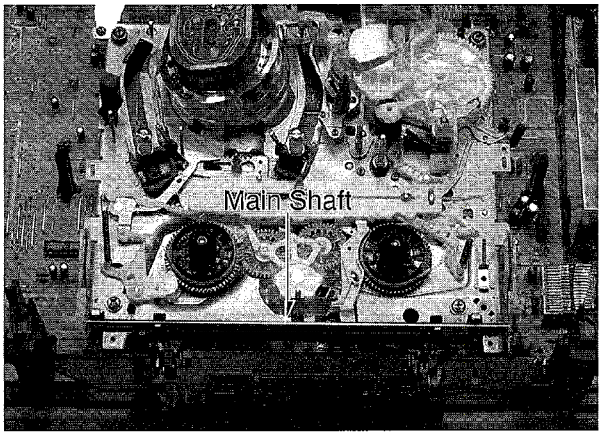


Fig. B6

3-2. Removal of Mechanism chassis

(1) Remove Mechanism chassis

Disconnect P3001, P2502 and P4001. Remove 5 screws (3 red screws and 2 gold screws) on Mechanism chassis and take out Mechanism chassis (Fig. B7).

TOP VIEW

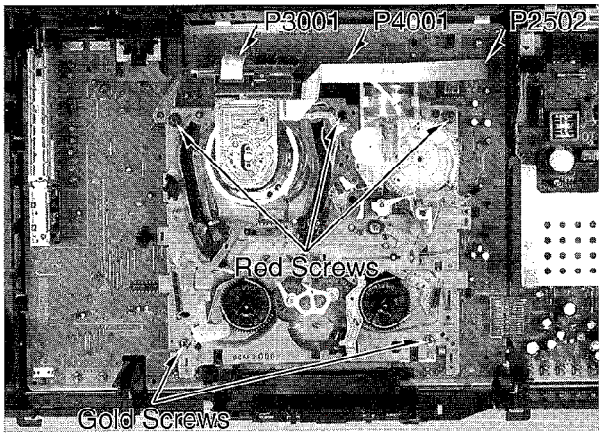


Fig. B7

4. DISASSEMBLY/ASSEMBLY METHOD FOR MECHANISM

4-1. Disassembly of mechanism

1. Removal of Pinch arm

   Unlock the tab (opener space). Remove Opener space and Pinch arm (Fig. C1).

2. Removal of Loading motor unit

   Unlock 3 tabs and remove Loading motor unit (Fig. C1 C2)

   2 tabs of them located on the bottom of the Mechanism (Fig. C2).

TOP VIEW

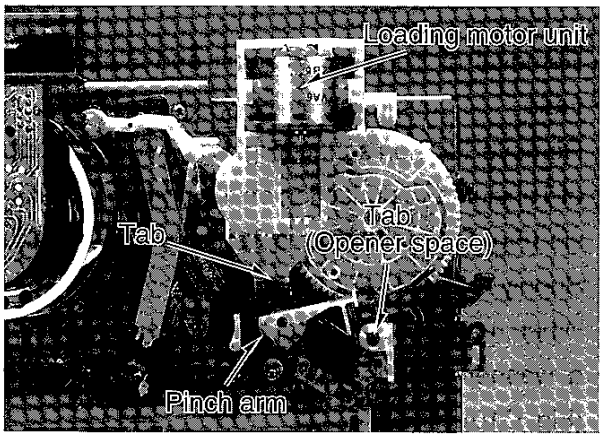


Fig. C1

BOTTOM VIEW

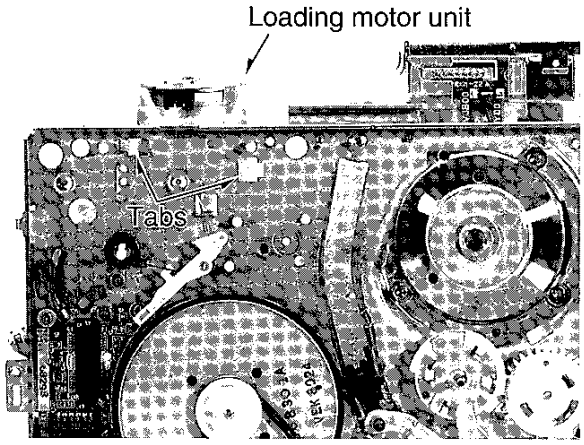


Fig. C2

3. Removal of Main cam gear

   Remove Snap washer located on the bottom of Chassis by using retaining ring remover (Fig. C3) and remove Main cam gear (Fig. C4).

BOTTOM VIEW

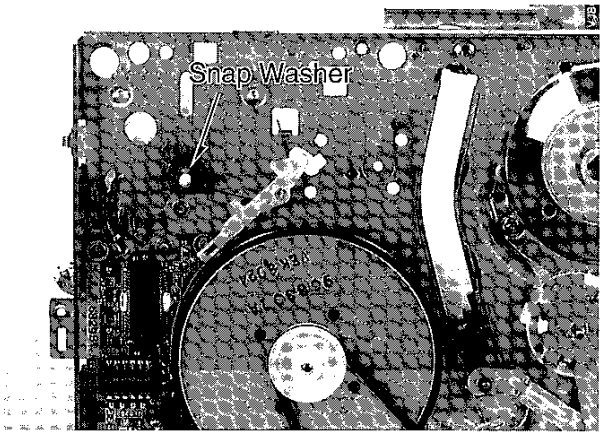


Fig. C3

TOP VIEW

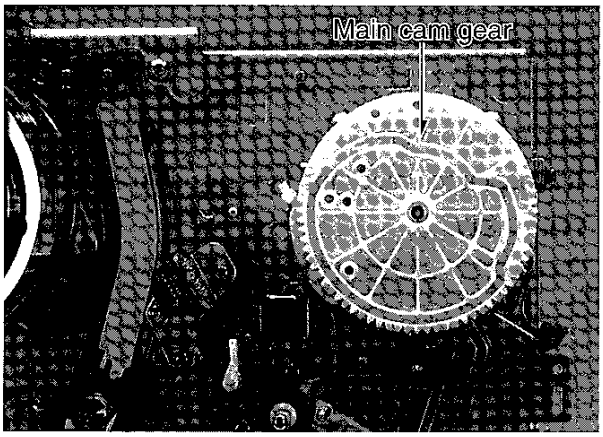


Fig. C4

4. Removal of Drive rack arm

Rotate Drive rack arm to the counterclockwise and remove it (Fig. C5)

TOP VIEW

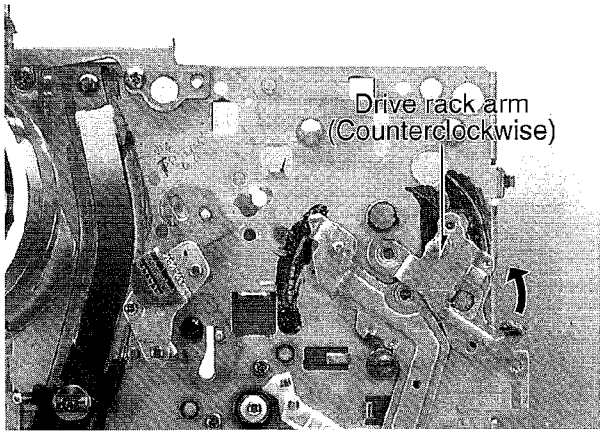


Fig. C5

5. Removal of Main lever, P5 arm and Conversion lever A

Removal cut washer located on the main lever. Unlock 2 tabs of Prism LED and 1 tab on the projection of Chassis while keep lifting the left side of Main lever, and remove Main lever, P5 arm and Conversion lever A (Fig. C6).

※ It is easier to unlock the tabs by using a tweezer.

TOP VIEW

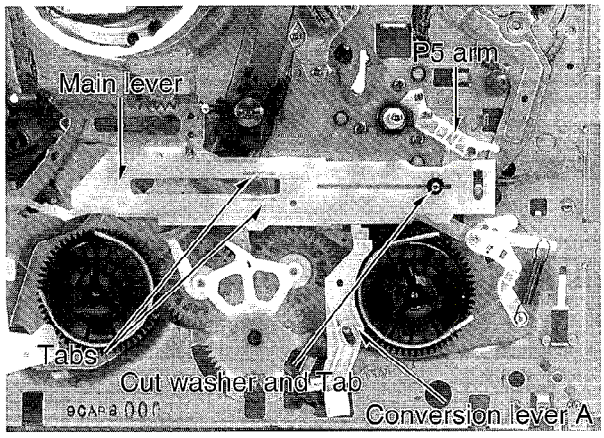


Fig. C6

6. Removal of Drive main lever arm

Rotate Drive main lever arm to the counterclockwise and remove it (Fig. C7).

TOP VIEW

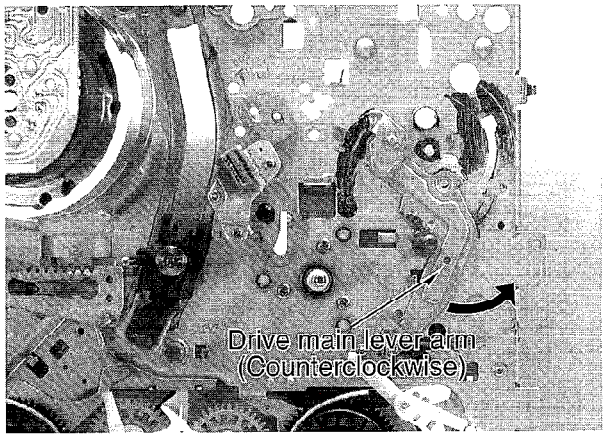


Fig. C7

7 Removal of Tension arm unit and Supply reel table

Remove Tension spring (Fig. C8). Unlock the tab of Tension arm projection on the bottom of Chassis (Fig. C9) and remove Tension arm unit and Supply reel table (Fig. C8).

※ When remove supply reel table, be sure whether a washer attaches on Supply reel table shaft (Fig. C10).

TOP VIEW

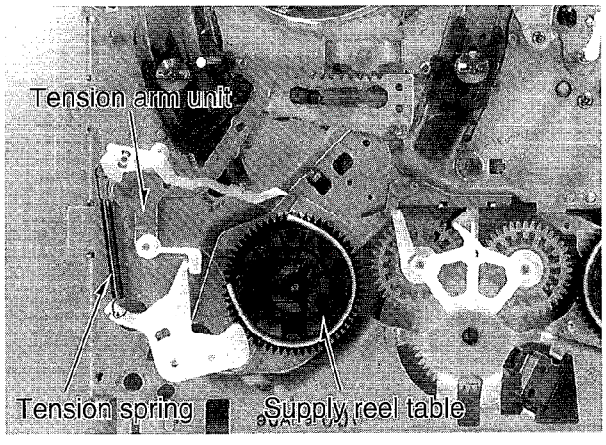


Fig. C8

BOTTOM VIEW

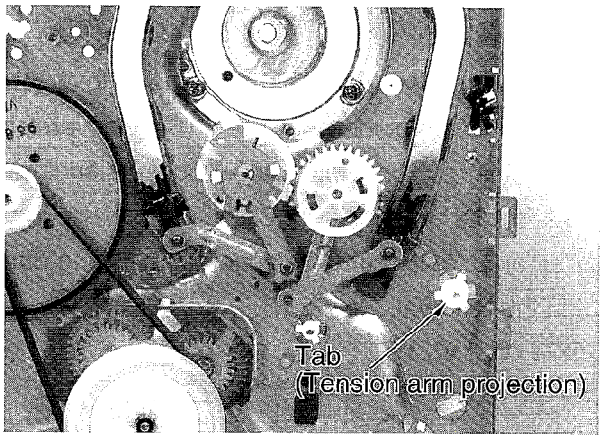


Fig. C9

TOP VIEW

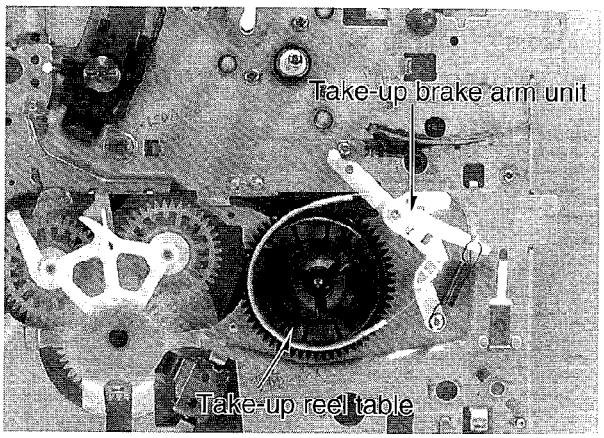


Fig. C11

SIDE VIEW

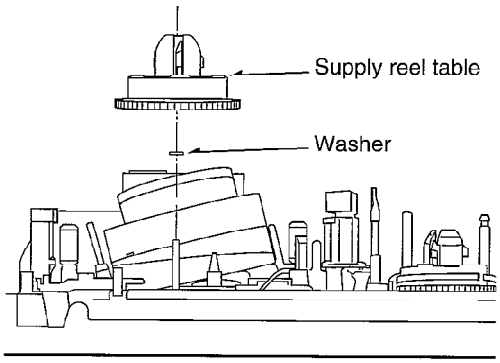


Fig. C10

8 Remove of Take-up brake arm unit and Take-up reel table

Unlock the tab of Take-up brake arm unit from the bottom of Chassis (Fig. C12). Remove Take-up brake arm unit and Take-up reel table (Fig. C11).

※ When remove Take-up reel table, be sure whether a washer attaches on Take-up reel table shaft (Fig. C13).

BOTTOM VIEW

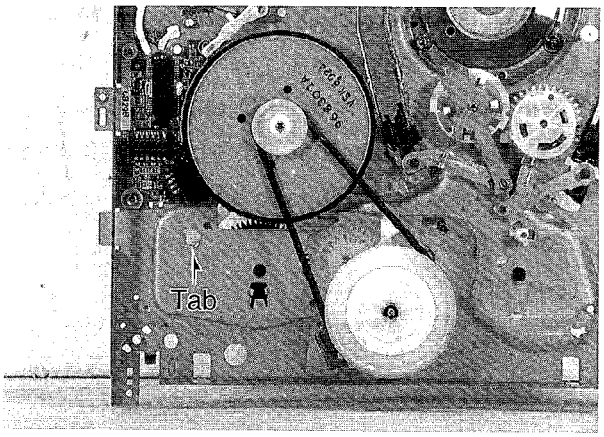


Fig. C12

SIDE VIEW

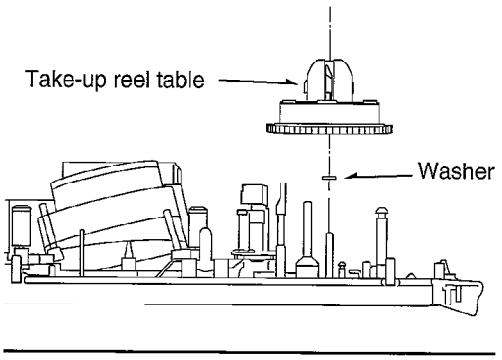


Fig. C13

9. Removal of Take-up & Supply loading arm
Unlock the tab and remove Take-up and Supply loading arm (Fig. C14).

BOTTOM VIEW

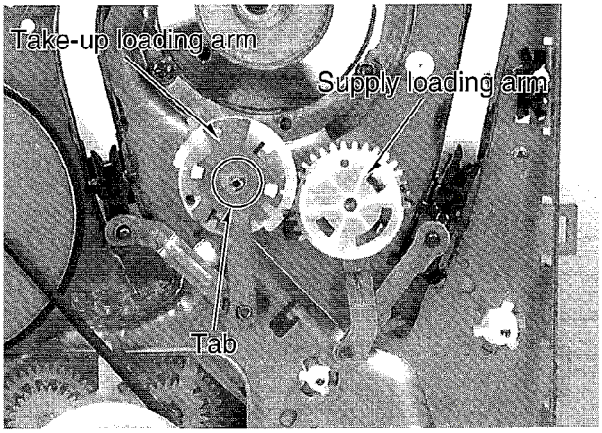


Fig. C14

10 Removal of Prism LED, Take-up & Supply shaft holder and Loading rack
Push the tab of Prism LED and remove Prism LED Remove Take-up and Supply shaft holder from the groove of Chassis and remove Loading rack (Fig. C15).

TOP VIEW

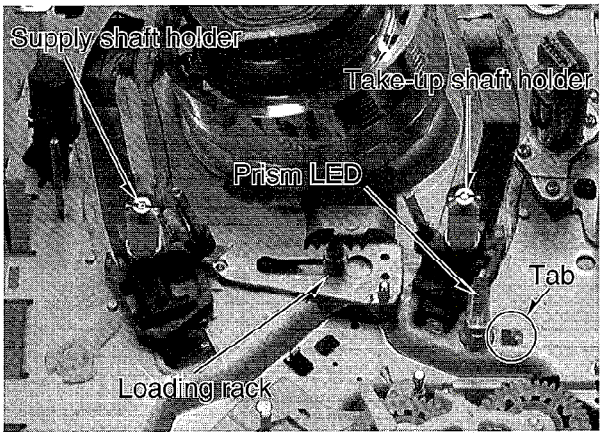


Fig. C15

11. Removal of Center clutch, Conversion gear spring, Conversion gear, Conversion lever B and Idler arm unit
Remove the Belt and the Cut washer (Fig. C16).
Remove Center clutch (Fig. C16) Conversion gear spring, Conversion gear, Conversion lever B and Idler arm unit (Fig. C17).

※ Pay an attention of Conversion gear spring during the removal.

BOTTOM VIEW

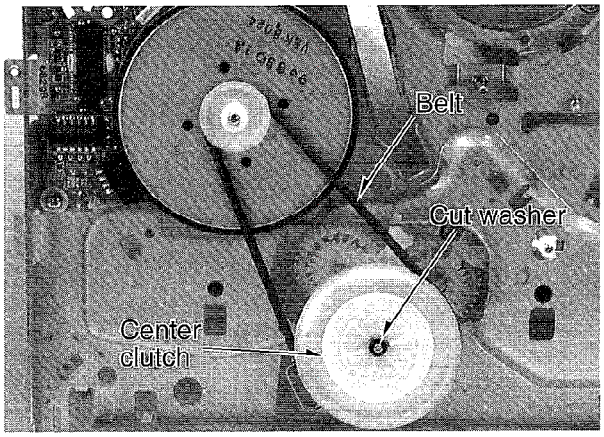


Fig. C16

BOTTOM VIEW

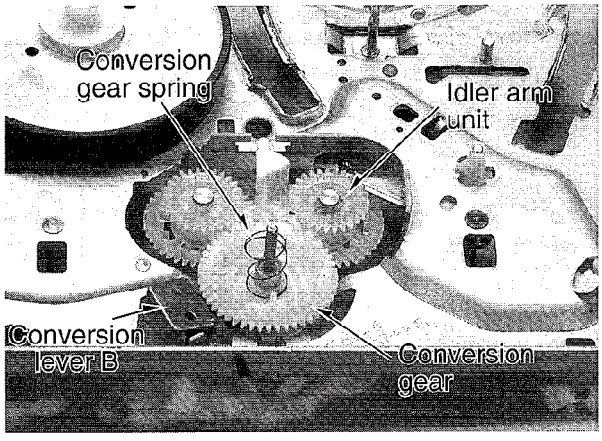


Fig. C17

12. Removal of Capstan unit

Remove 3 gold screws (Fig. C18).

Remove 2 gold screws on the bottom of Chassis (Fig. C19)

Keep moving SS brake arm and remove Capstan unit.

TOP VIEW

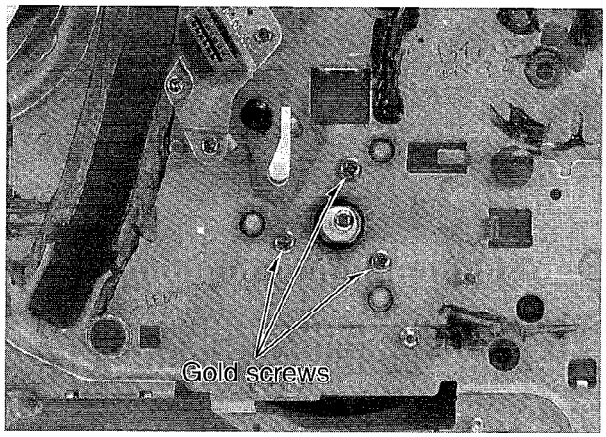


Fig. C18

BOTTOM VIEW

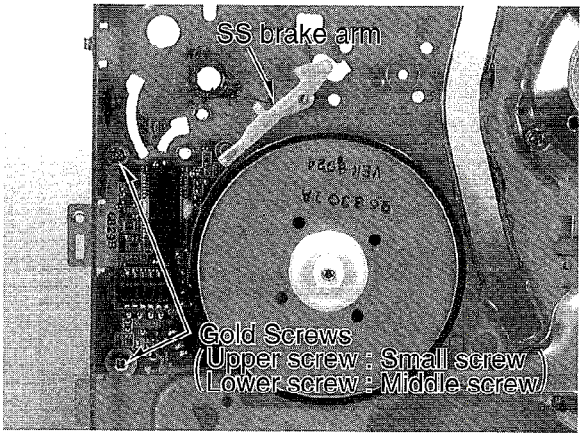


Fig. C19

13. Removal of Cylinder unit

Removal red screw (Fig. C20).

Remove 3 gold screws on the bottom of Chassis and remove Cylinder unit (Fig. C21).

TOP VIEW

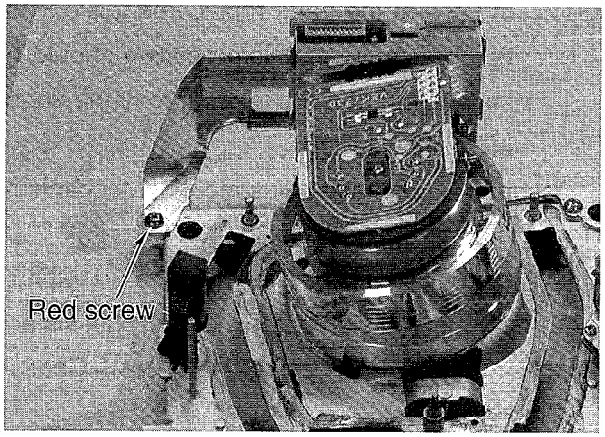


Fig. C20

BOTTOM VIEW

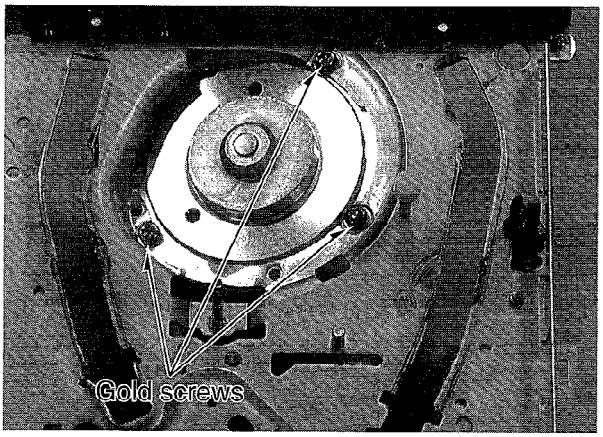


Fig. C21

4-2. Assembly and phase adjustment of mechanism

The gear phase alignment has been performed in the EJECT position and it is crucial for the Z Mechanism to operate correctly.

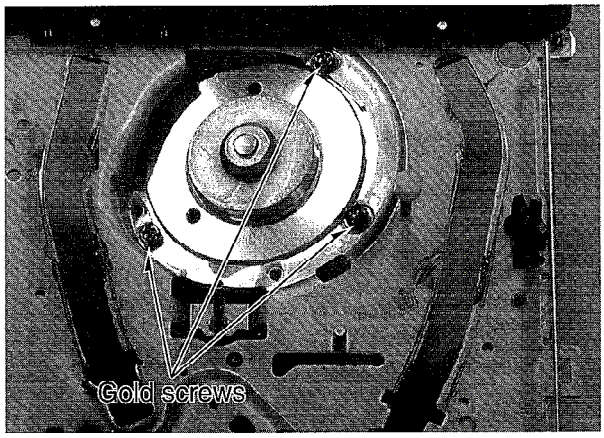
NOTE: In case of the parts replacement like Position switch, Mechanism position should be set to Eject position in order to fit the phase of Position switch

1 Assembly and phase adjustment of Mechanism

(1) Assembly of Cylinder unit

Cylinder unit should be fixed by 3 screws (GOLD) from the bottom side of Mechanism chassis and red screw on the top side of Mechanism Chassis (Fig. E1, E2).

BOTTOM VIEW



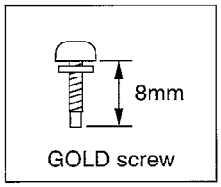
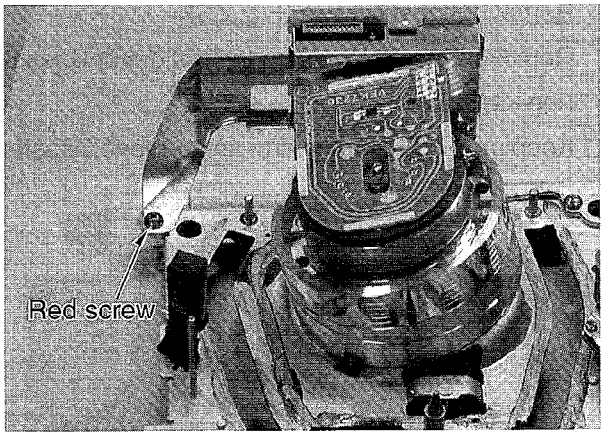


Fig. E1

TOP VIEW



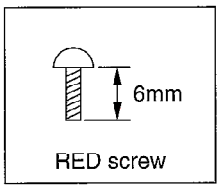
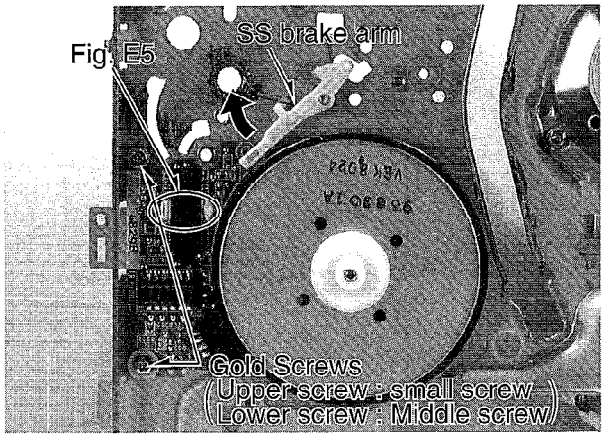


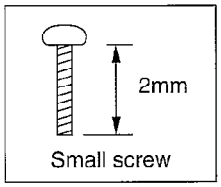
Fig. E2

(2) Assembly of Capstan unit

Move SS brake arm in the direction of arrow (see Fig. E3) and capstan unit should be fixed by 2 screws (GOLD) on the bottom side of Mechanism chassis and 3 screws (GOLD) on the top of Mechanism chassis (Fig. E3 E4)

BOTTOM VIEW





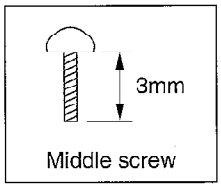
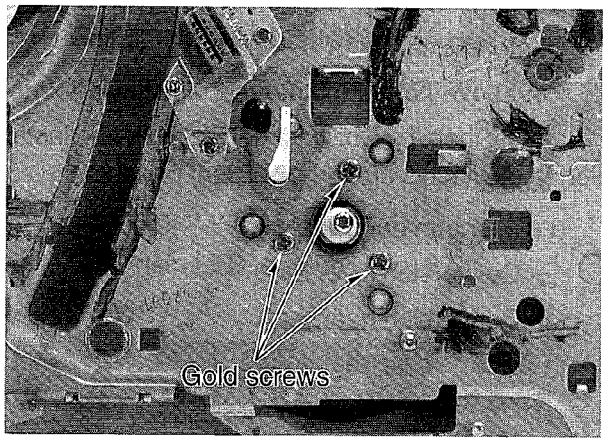


Fig. E3

TOP VIEW



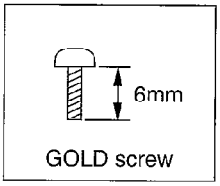


Fig. E4

NOTE: Replacement of Capstan unit and Procedure of applying the silicone grease.

REPLACEMENT OF CAPSTAN UNIT

In case of replacement of the Capstan Unit the Silicone grease have to be applied between the Mechanism chassis and the Drive IC by the following procedure.

Silicone grease No. VFK1301 for radiation of the Drive IC

Silicone grease is used for the radiation of the Drive IC. The heat occurred on the IC is radiated to the Mechanism chassis through the grease. In case of the incomplete radiation, the safety circuit operates depending on the rise of the temperature and it possibility stop the operation of the Drive IC

PROCEDURE OF APPLYING THE SILICONE GREASE

① There is a cut-out part at the Drive IC mounting position and the bottom of the IC can be seen from the cut-out part Apply the Silicon grease to whole the cut-out part of IC as shown in Fig. E5-1 so that the grease is piled 0 3–0 5 mm from the surface of the C B A

② Next, from the component side of the C.B A., apply the Silicon grease so that the grease is piled at the metal of the center of the IC as shown in Fig. E5-2.

Fig. E5-1. Apply the Silicon grease so that the grease is piled 0.3 0.5 mm from the surface of the C.B.A.

Fig. E5-2. Apply the Silicon grease at the metal of the center of the IC.

SIDE VIEW

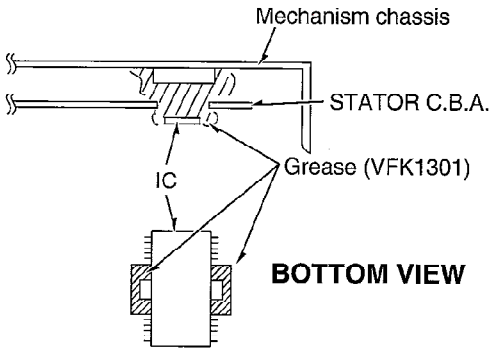


Fig. E5

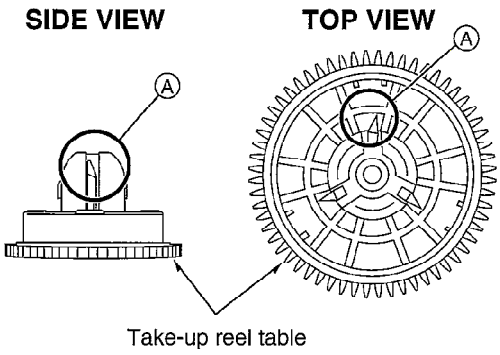


Fig. E11

(7) Assembly of Supply reel table and Tension arm unit

Install washer (Fig. E13) and Supply reel table. Insert Tension arm unit to Tension arm projection and hang Tension spring with Supply spring arm projection (Fig. E12).

※1 Pay an attention of Position of the Supply spring arm.

NOTE: The shape between portion A for Take-up reel table and portion B for Supply reel table is different.

Therefore, confirm the shape of portion A and B before mounting reel tables. If Take-up reel table has been confused with Supply reel table and they have been installed, the trouble of reel table rotation slip happens (Fig. E14).

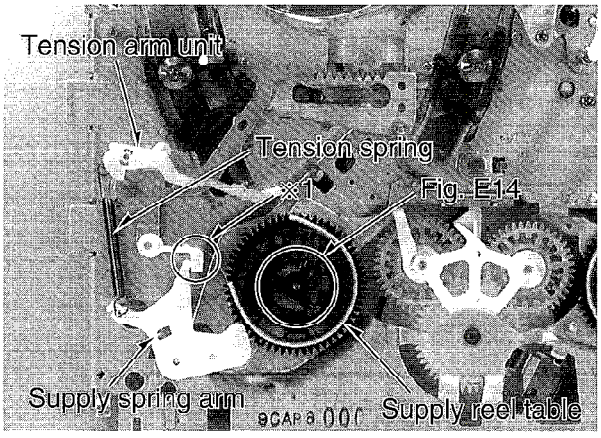


Fig. E12

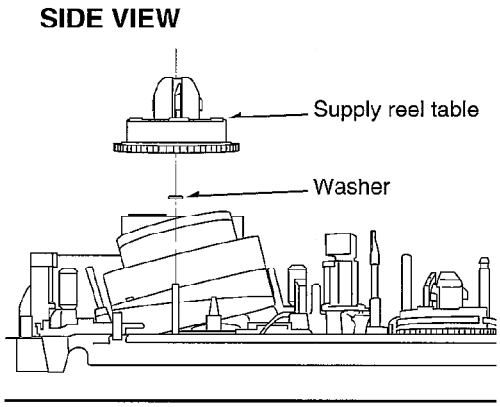


Fig. E13

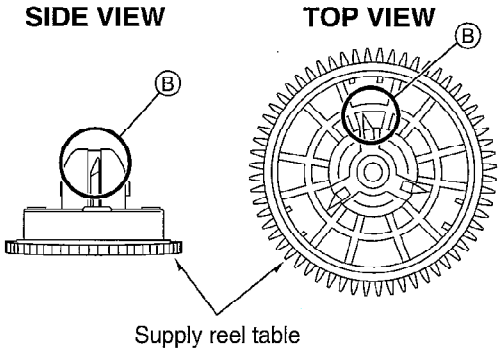


Fig. E14

(8) Assembly of Drive main lever arm

Install Drive main lever arm so that Drive main lever arm fits to the groove of Chassis.

And rotate Drive main lever arm to the clockwise in order to adjust the phase between the hole of the position fixture and the penetration hole of Chassis (Fig. E15).

TOP VIEW

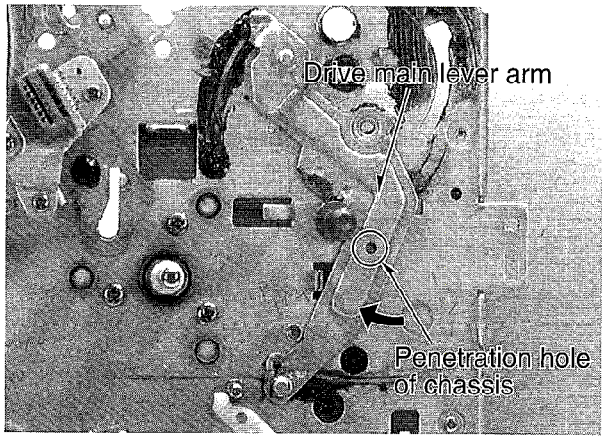


Fig. E15

(9) Assembly of Conversion lever A, P5 arm and Main lever

Install Conversion lever A and P5 arm (Fig. E16, E17).

Adjust the phase of Main lever so that Main lever fits the projection of Loading rack.

Main lever has to be locked at the projection of Chassis by 2 tabs of Prism LED (Fig. E16).

※ Conversion lever A, P5 arm, Supply brake arm unit and the projection of Take-up brake arm have to be installed to the groove under the Main lever (Fig. E18).

TOP VIEW

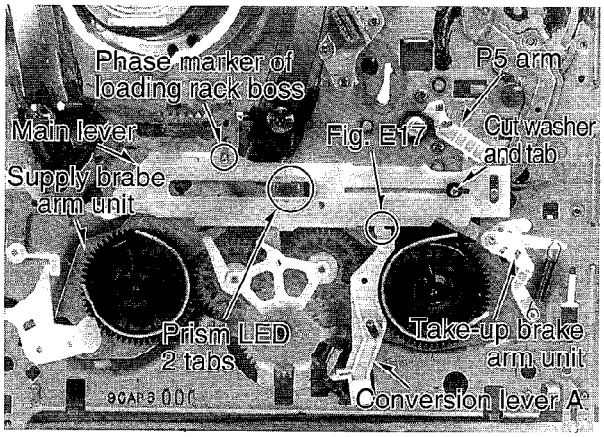


Fig. E16

TOP VIEW

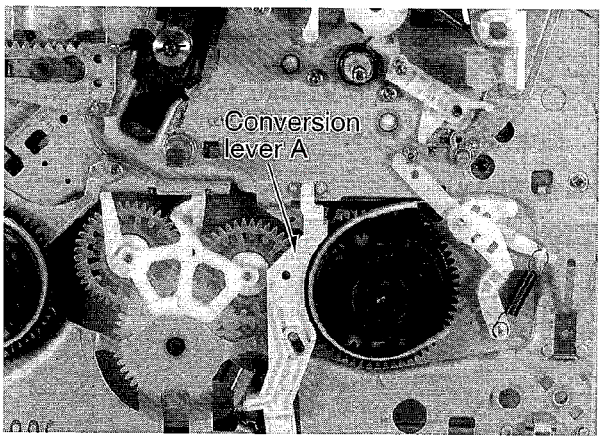


Fig. E17

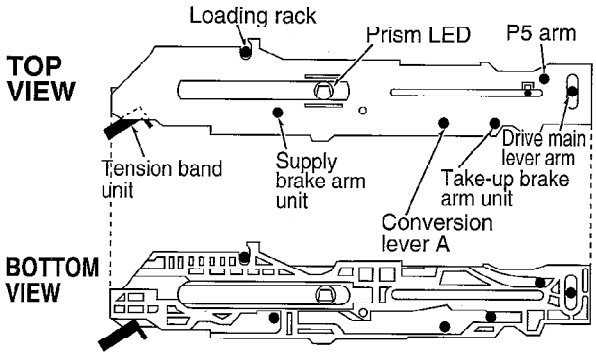


Fig. E18

(10) Assembly of Drive rack arm

Install Drive rack arm so that Drive rack arm fits the groove of Chassis and rotate it to the clockwise in order to fit the penetration hole of Chassis (Fig. E19)

TOP VIEW

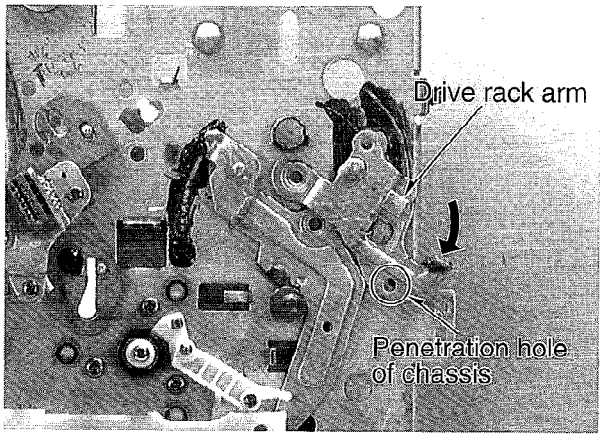


Fig. E19

(11) Assembly of Main cam gear

Install Main cam gear so that Main cam gear fits the penetration hole of Chassis (Fig. E20) and fix it by the snap washer from the bottom of Chassis (Fig. E21).

TOP VIEW

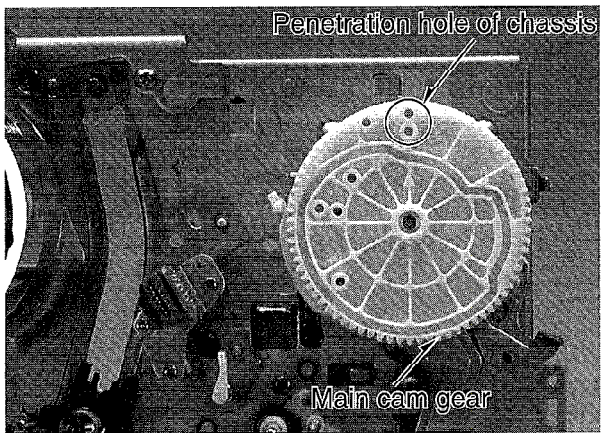
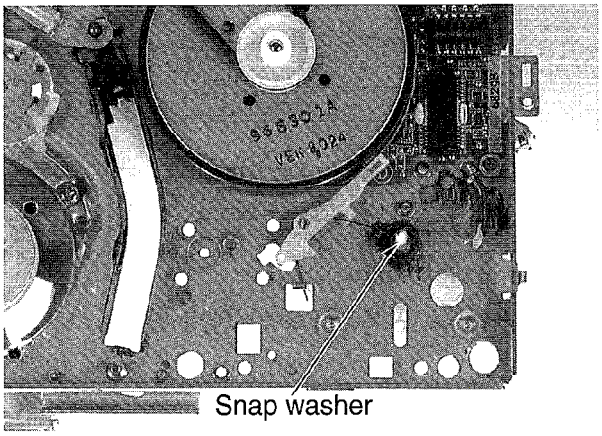


Fig. E20

BOTTOM VIEW



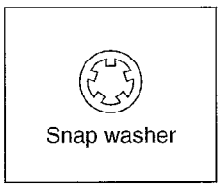


Fig. E21

(12) Assembly of Loading motor unit

Install Loading motor unit so that Loading motor unit fits the groove of Chassis (Fig. E22).

(13) Assembly of Pinch arm

Put Pinch arm together and install Opener space to fix Pinch arm (Fig. E22).

TOP VIEW

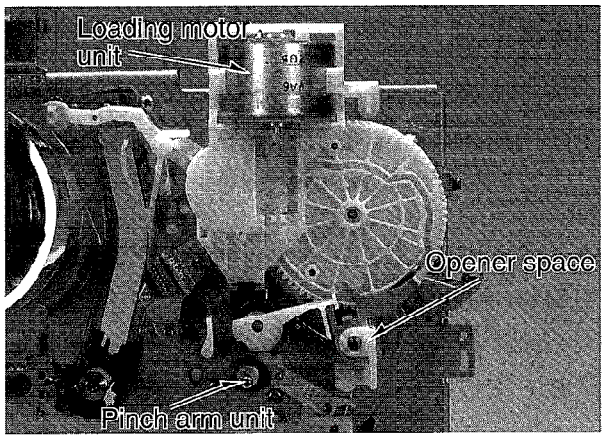


Fig. E22

4-3 Assembly of mechanism chassis

1 Assembly of Mechanism chassis

(1) Adjust the phase of Position switch in Main C B A..

Rotate Position switch until the click point. The projection of Position switch should be set to just above (Fig. F1)

TOP VIEW

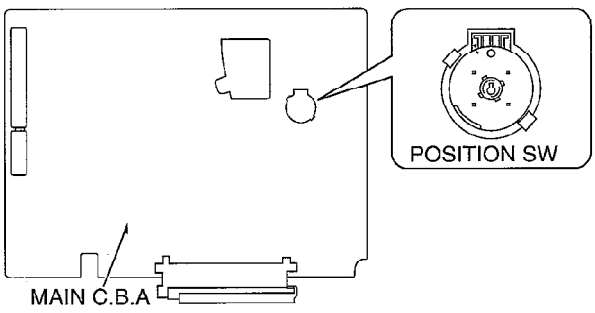


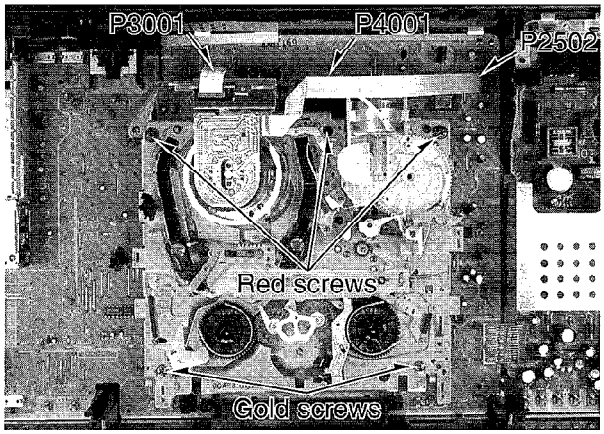
Fig. F1

(2) Assembly of Mechanism chassis

Put Mechanism chassis on Main C.B.A. and fix it by 5 screws (3 red screws and 2 gold screws).

Connect P3001, P2502 and P4001 (Fig. F2)

TOP VIEW



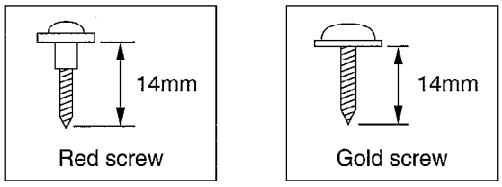


Fig. F2

※ The red screws has a gap among the chassis. Therefore be careful not to tighten too much.

2. Assembly of Cassette holder unit

(1) Assembly of Main shaft

Install Main shaft so that Main shaft fits the groove of Chassis (Fig. F3)

TOP VIEW

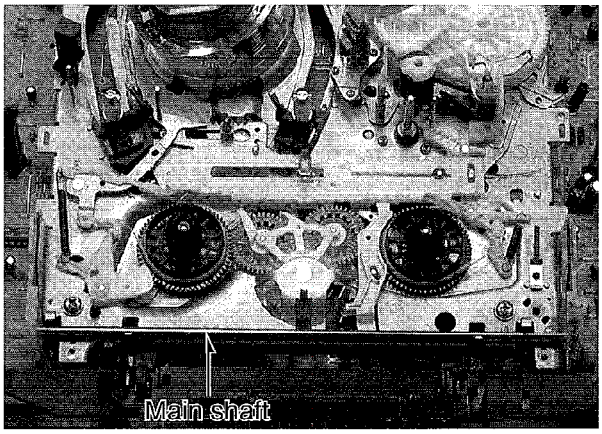


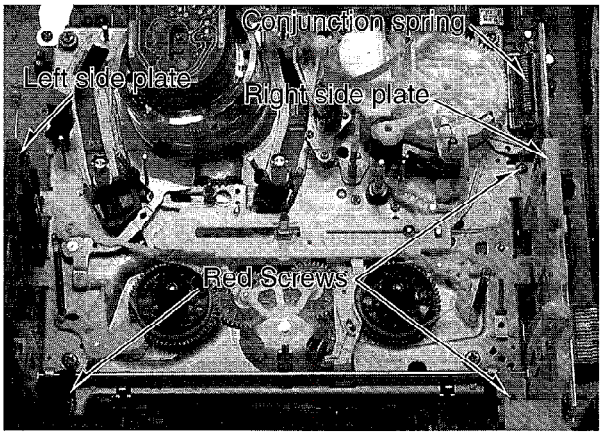
Fig. F3

(2) Assembly of Left & Right side plate

Install Left side plate so that Left side plate fits the groove of Chassis and fix it by the red screws.

After adjustment the phase of waper arm and Drive rack (Fig. F5), install Right side plate so that Right side plate fits the groove of Chassis and fix it by 2 red screws. Hang Conjunction spring on the projection of Drive rack arm (Fig. F4, F5).

TOP VIEW



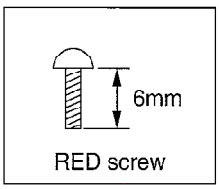


Fig. F4

SIDE VIEW

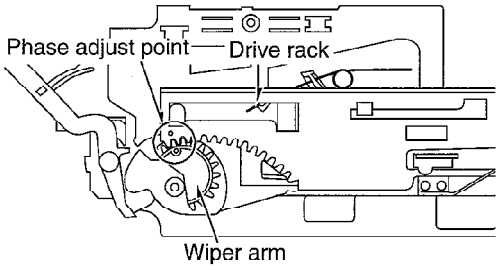


Fig. F5

TOP VIEW

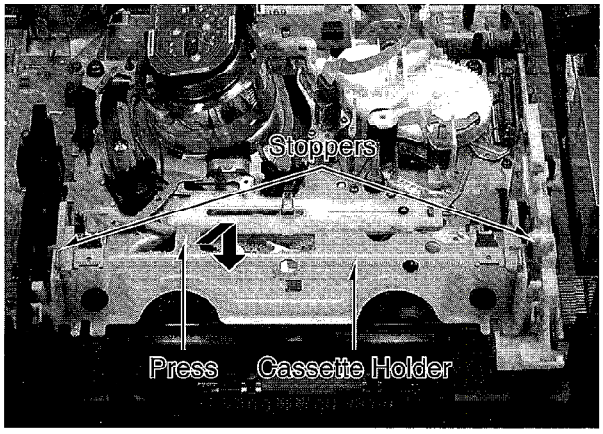


Fig. F6

(3) Assembly of Cassette holder

Install Cassette holder so that Cassette holder fits the groove of Waper arm installed in Main shaft (Fig. F6, F7).

TOP VIEW

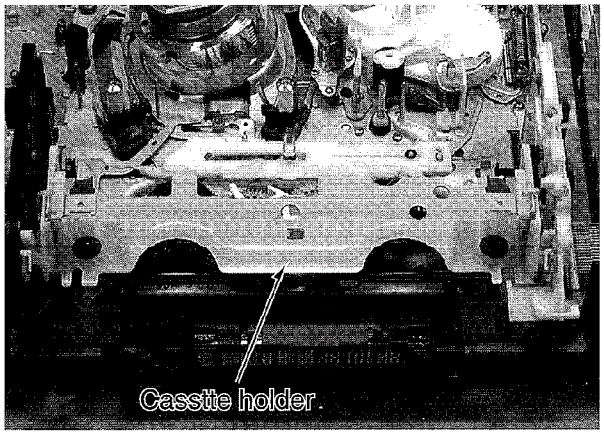


Fig. F7

(4) Assembly of Top plate

Install Top plate so that Top plate fits the groove of Left and Right side plate.

※ Fix Top plate by tightening screw when the tabs of Left and Right side plate broke (Fig. F8)

TOP VIEW

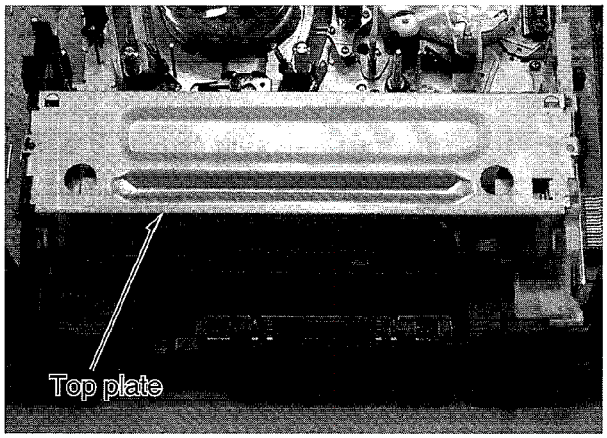
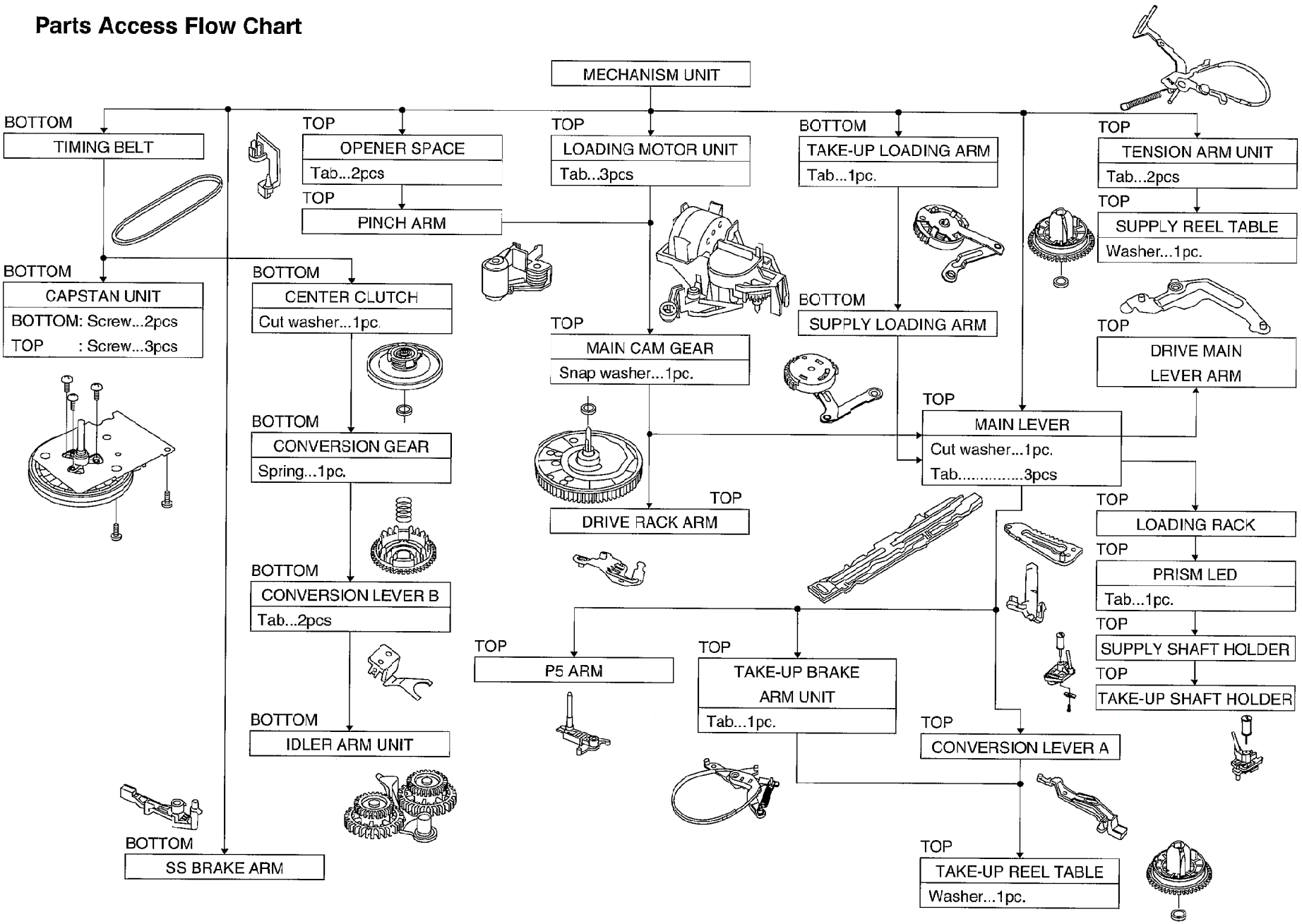


Fig. F8

(5) Install Front panel unit and Top panel

Parts Access Flow Chart



5. MECHANICAL ADJUSTMENT PROCEDURE

5-1. Tension post position adjustment

Equipment required: Hex. Wrench (VFK0326)
Specification: 50.5±1.5 mm

(1) Disconnect the AC plug.

(2) Remove the TOP PLATE.

(3) Turn the LOADING MOTOR until the loading completes.

(4) Adjust the hole of Tension Band Fastener by Hex Wrench until the distance between the Tension Post and the center of Supply reel table is 50.5±1.5 mm as shown in Fig. M1.

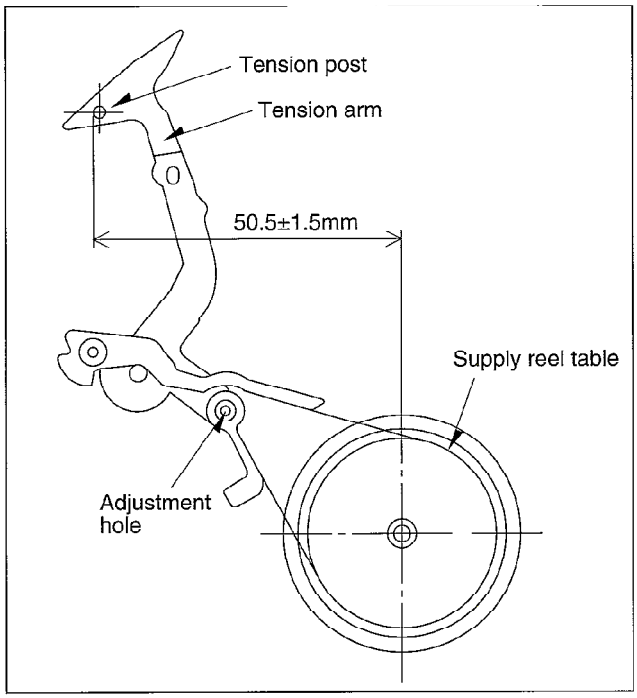


Fig. M1

5-2. Back tension adjustment

Equipment required:
Back Tension Meter (VFK0132)
VHS Cassette tape (180 minutes tape: PAL)
VHS Cassette tape (120 minutes tape: NTSC)
Specification: 22.5–27.5g

(1) Playback the cassette tape from the beginning and wait until the tape movement get the stabilization. (for approx. 10–20 seconds)

(2) Insert the Back Tension Meter into the path of a tape, and measure the back tension to be within specification as shown in Fig. M2.

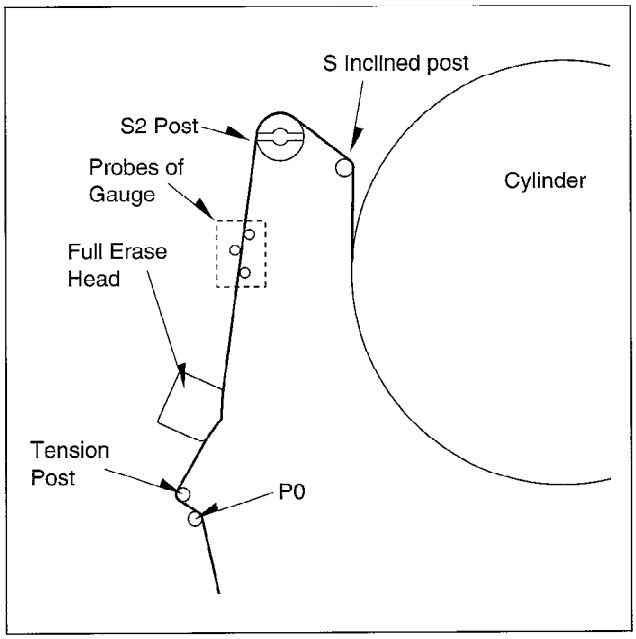


Fig. M2

(3) If it is out of specification, change the spring notch as shown in Fig. M3.

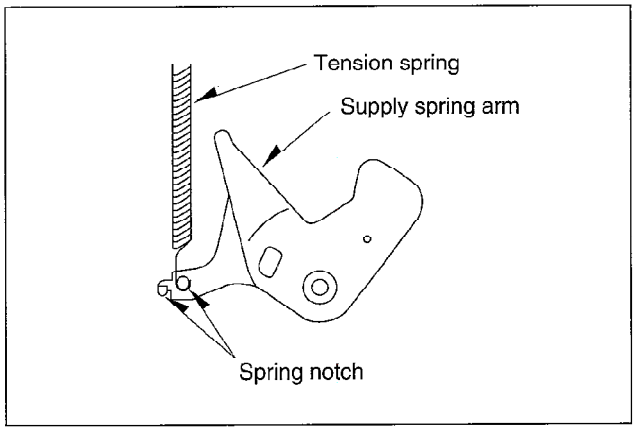


Fig. M3

5-3. P2 and P3 posts adjustment (PREADJUSTMENT)

Equipment Required:
Post Adjustment Screwdriver (VFK0329)

(1) Remove the Top Plate.

(2) Turn the Loading Motor until the unloading completes.

(3) Rotate the P2 and P3 Posts clockwise to the end. (Fig. M4)

(4) Rotate the P2 and P3 Posts twice counterclockwise. (Fig. M4)

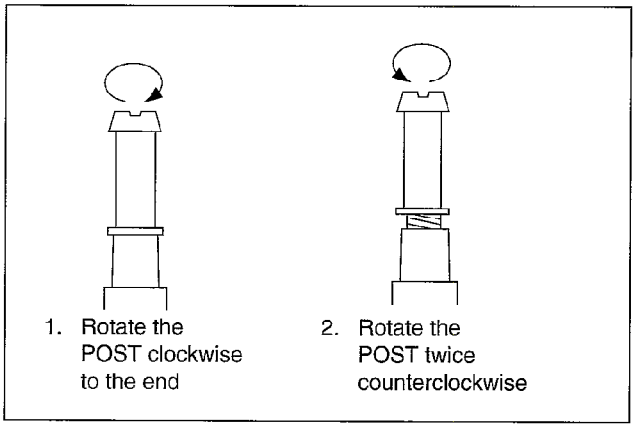


Fig. M4

(5) Playback the cassette tape and make sure that the edges of the tape are not curling at the bottom or top end of the P2, P3, and P4 Posts as shown in Fig. M5.

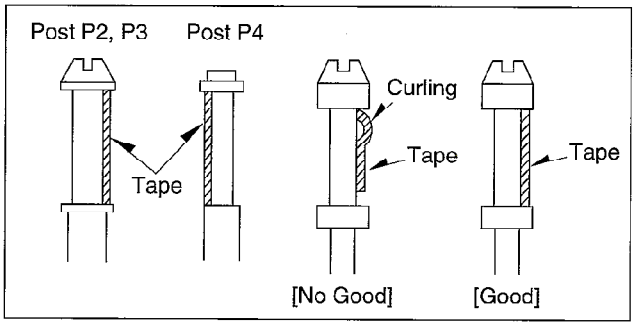


Fig. M5

(6) If the curling appears, readjusts the P2 and P3 Posts.

5-4. Tape interchangeability adjustment

Carry out the following procedures for Tape Interchangeability Adjustment to do it correctly and smoothly.

(1) P2 AND P3 POSTS ADJUSTMENT
(2) ADJUSTMENT OF P4 POST
(3) HEIGHT ADJUSTMENT OF A/C HEAD
(4) FINE-ADJUSTMENT OF A/C HEAD
(5) ADJUSTMENT OF X-VALUE (PREADJUSTMENT)
(6) FINE-ADJUSTMENT OF X-VALUE

If the Tape Interchangeability Adjustment is not perfect, repeat the above procedures from (1) to (6).

CAUTIONS: To make an Adjustment Mode for Tape Interchangeability, press the FF, REW and EJECT buttons simultaneously 3 times to set the Service Mode 2.

NOTE: Cleaning the Tape Transport path before adjusting of Tape Interchangeability. The detail portion is shown below.

P0 Post, Tension Posts, FE Head, P2 Post, Supply Inclined Post, Cylinder Unit, Take-up Inclined Post, P3 Post, A/C Head, P4 Post, Pinch Roller, Capstan Shaft, P5 Post. FE Head, Cylinder Unit, A/C Head and Capstan Shaft are more important parts and pay an attention to clean them.

5-4-(1). P2 AND P3 POSTS ADJUSTMENT

Equipment required:
Alignment Tape (PAL/SECAM: VFJ8125H3F)
(NTSC: VFM8080HQFP)
Post Adjustment Screwdriver (VFK0329)

(1) Connect the oscilloscope to the output of the Head Amp as shown in Fig. M6.

NOTE: To get a stable waveform of the Head Amp output (observation point TW3001 and TW2001 located on Main C.B.A.) on the oscilloscope, use the head switching pulse as a triggering signal as shown in Fig. M6.

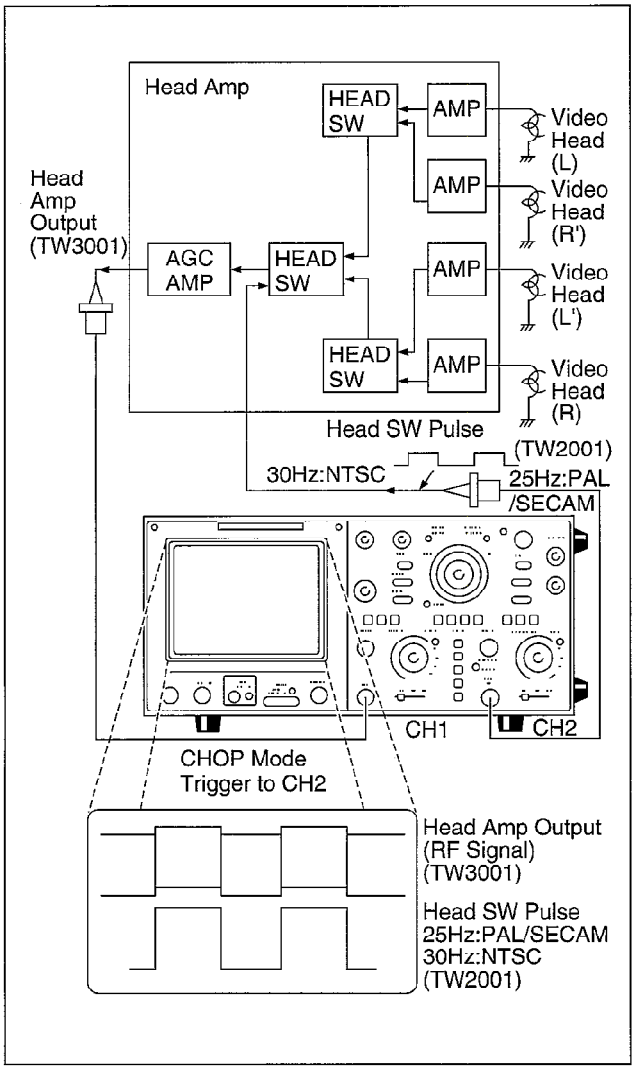


Fig. M6 Connect of Oscilloscope

(2) Playback the Alignment Tape.

(3) If the RF envelope appears like example "A" or "B" in Fig. M7, then adjustment of the tape guide post (P2: Entrance) is necessary.

(4) Adjust the tape guide post (P2) with the post adjustment screwdriver so that the RF envelope waveform at the entrance portion becomes flat as shown in Fig. M7 "C".

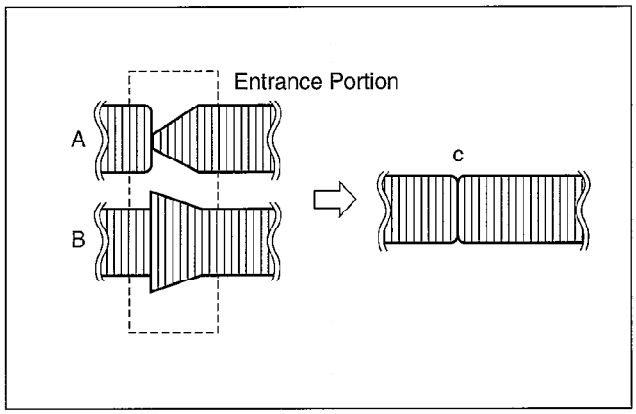


Fig. M7

(5) If the RF envelope appears like "D" or "E" in Fig. M8, then adjustment of the tape guide post (P3: Exit) is necessary.

(6) Adjust the tape guide post (P3) in the same manner as the P2 post so that the exit portion becomes flat as shown in Fig. M8 "F".

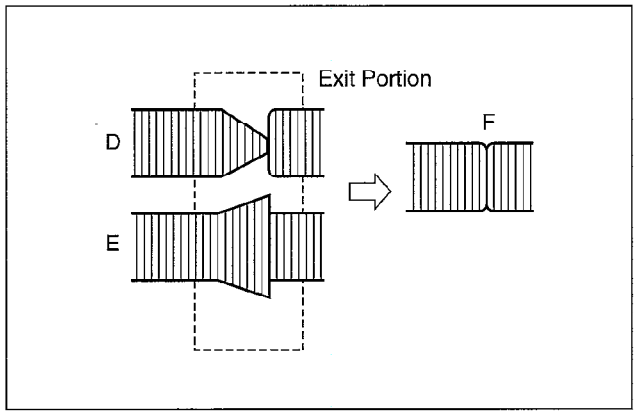


Fig. M8

(7) Keep pressing the tracking up/down (∧ or ∨) buttons on the remote controller unit. The output envelope should vary nearly parallel with other condition as shown in Fig. M9.

(8) Set the tracking control into center fix position by pressing the tracking up/down (∧ and ∨) simultaneously and adjust for maximum RF envelope, whilst being as flat as possible.

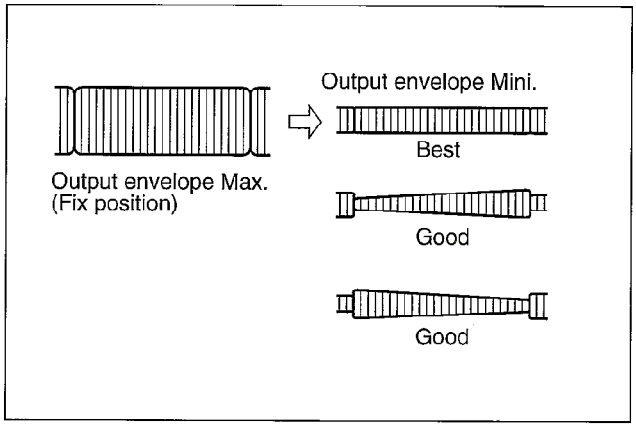


Fig. M9

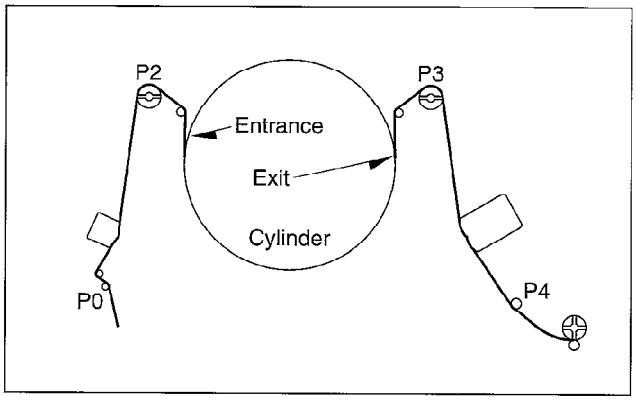


Fig. M10 Loading of Posts

5-4-(2). ADJUSTMENT OF P4 POST

(1) Install A/C Head on the Mechanism Chassis by one screw.

(2) Playback the Alignment Tape.

(3) Rotate the screw (A) or (B) until the wrinkle appears on the lower edge of tape at P4 Post.

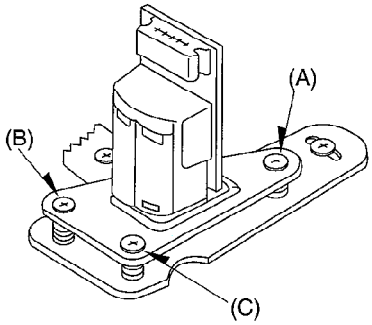
(4) Rotate the screw (A) or (B) until the wrinkle just disappears on the lower edge of tape at P4 Post.

(5) Connect the oscilloscope to audio output terminal.

(6) Rotate the screw (C) until audio signal is maximized.

NOTE: 1. The relation between the rotation direction of screws (A) and (B) and the condition of wrinkle on the lower edge at P4 Post as shown in Fig. M11.

2. Make sure that there is not the inclined wrinkle between P4 Post and Pinch Roller.



	SCREW (A)	SCREW (B)
So wrinkle appears on the lower edge of tape	COUNTER CLOCKWISE	CLOCKWISE
So wrinkle disappears on the lower edge of tape	CLOCKWISE	COUNTER CLOCKWISE

Fig. M11

5-4-(3). HEIGHT ADJUSTMENT OF A/C HEAD

<When moving the A/C Head up>

(1) Rotate the screw (A) counterclockwise until the wrinkle appears on the lower edge of tape at P4 Post.

(2) Rotate the screw (B) counterclockwise until the wrinkle just disappears on the lower edge of tape at P4 post.

(3) Rotate the screw (C) counterclockwise until the audio signal is maximized.

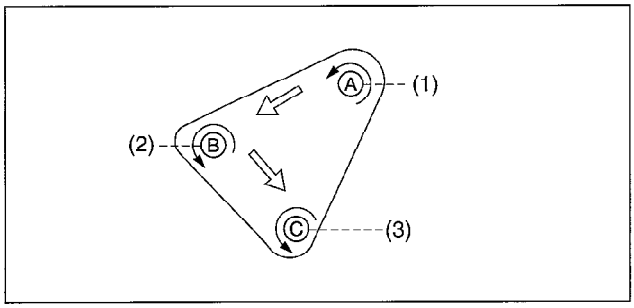


Fig. M12

<When moving the A/C Head down>

(1) Rotate the screw (B) clockwise until the wrinkle appears on the lower edge of tape at P4 Post.

(2) Rotate the screw (A) clockwise until the wrinkle just disappears on the lower edge of tape at P4 post.

(3) Rotate the screw (C) clockwise until the audio signal is maximized.

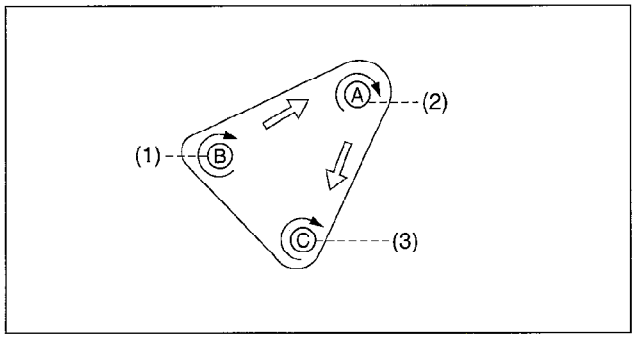


Fig. M13

5-4-(4). FINE-ADJUSTMENT OF A/C HEAD

(1) Connect the oscilloscope to the output of the Head Amp as shown in Fig. M6.

(2) Playback the Alignment Tape.

(3) Make sure that the condition of the wrinkle at P4 Post. If the condition of the wrinkle is out of specification, P4 Post adjustment has to be performed as follows.

Turn the screw (A) counterclockwise until the wrinkle appears on the lower edge of tape at P4 Post.

Turn the screw (A) clockwise until the wrinkle disappears on the lower edge of tape at P4 Post.

(4) Turn the screw (C) until the audio signal is maximized.

NOTE: Make sure that the audio output does not increase when push the upper and lower edges of tape around A/C Head.

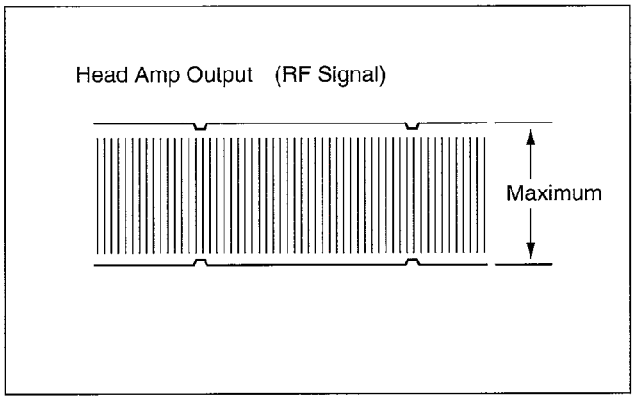


Fig. M14

5-4-(5). ADJUSTMENT OF X-VALUE (PREADJUSTMENT)

Equipment required:
Fine Adjustment Gear Drive (VFK0330)
Specification: Less than 15 msec.

(1) Connect the oscilloscope to the audio output and the video output. Both output signals should be fixed by the external trigger.

(2) Playback the Alignment Tape and set the tracking control into center fix position.

(3) Adjust A/C Head position by the Fine Adjustment Gear Driver (VFK0330) to meet the signal fault portion of the audio output and the video output signals (Less than 15 msec.).

(4) After meeting the signal fault portion, adjust A/C Head position by the Finc Adjustment Gear Driver (VFK0330) until the video envelope is maximized.

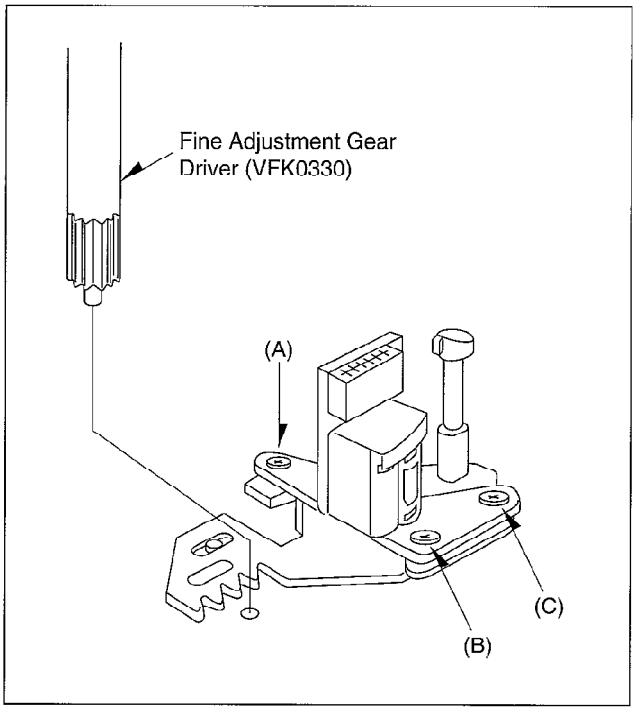


Fig. M15

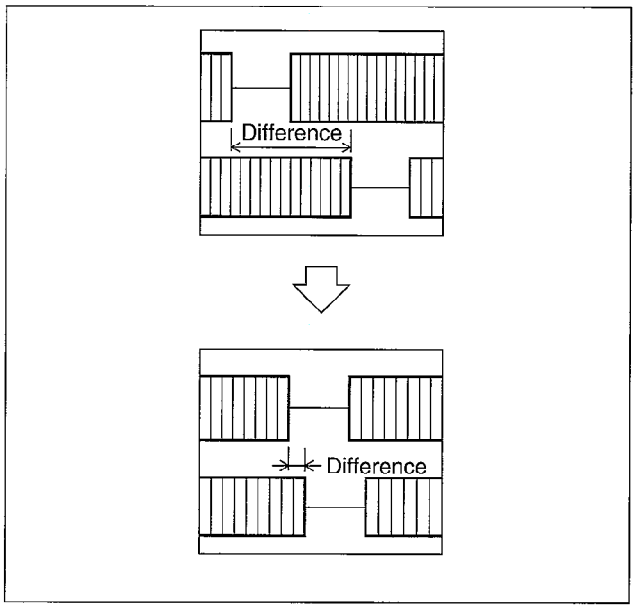


Fig. M16

5-4-(6). FINE-ADJUSTMENT OF X-VALUE

Equipment required:
Fine Adjustment Gear Drive (VFK0330)

(1) Connect the oscilloscope to the audio output and the video output. Both output signals should be fixed by the external trigger.

(2) Playback the alignment tape and set the tracking control into center fix position.

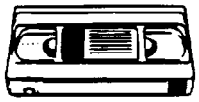
(3) Adjust A/C Head position by the Fine adjustment Gear Driver (VFK0330) until the video envelope level is maximized at the tracking center fix position.

NOTE: During X-Value Fine Adjustment, in case the video envelope level became 0, Preadjustment of X-value should be adjusted again due to it is possibility to vary the X-value adjustment.

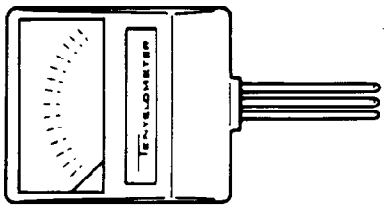
Servicing Fixtures & Tools

VFJ8125H3F
PAL VHS Alignment Tape

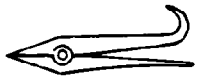
VFM8080HQFP
NTSC VHS Alignment Tape



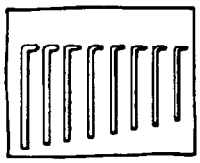
VFK0132
Back Tension Meter
(Tentelometer, Made in U.S.A.)



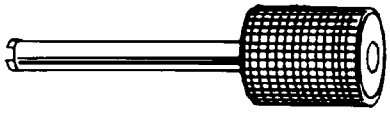
VFK0335
Retaining Ring Remover
(3mm/4mm)



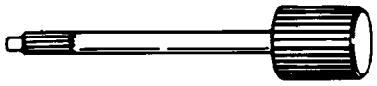
VFK0326
Hex. Wrench Set
(0.7, 0.9, 1.2, 1.5, 1.6, 2.0, 2.4, 3.0mm)



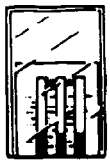
VFK0329
Post Adjustment Screwdriver



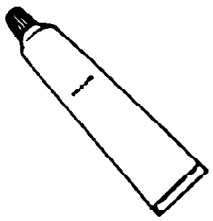
VFK0330
Fine Adjustment Gear Driver



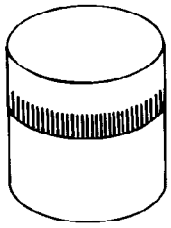
VFK27
Hand Cleaning Stick



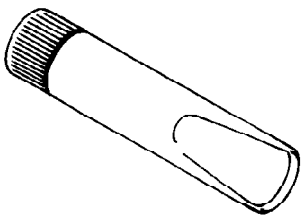
VFK1024
Morlytone Grease



VFK1298
Floil Grease



VFK1301
Silicone Grease



6. SELF-TEST INDICATION DISPLAY

This VTR has a self-diagnosis and display function. If the VTR detects trouble during installation or during use, one of the following fault indication codes will automatically appear in the VTR display. Fault indication codes are displayed in the form of a single English letter followed by two numbrs, as for example "H01".

Note: 1. The indication "U" is displayed on the FIP while power remains on.

2. Otherwise, the indication "H" or "F" is displayed on the FIP, and the power is automatically turned off

   When the power is turned on again, the fault indication code will disappear and the unit will retrun to normal display mode (either clock or counter is displayed).

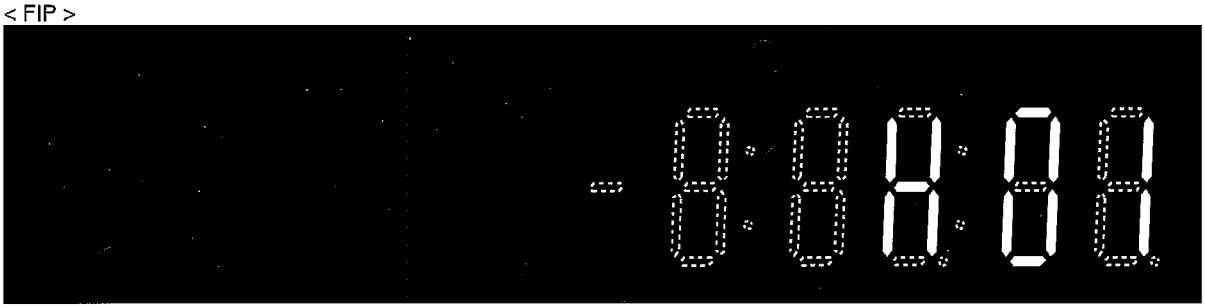
3. This fault indication code will be stored in the Timer microprocessor even with the AC plug disconnected.

   The two-digit number portion of the stored fault indication code can be redisplayed in the FIP's "second" display portion (the last 2 digits on the light) by placing the unit is Service Mode Number 2 when turning on Service Information Display as for example "01" or "02" etc.

   If a second error occurs, only the most recent error will be displayed and stored.

4. To erase the stored fault indication code data, Press FF, REW and EJECT buttons for 5 seconds.

< FIP >



INDICATION	CAUSE	REMEDY/CHECK
U 10	Dew formation.	Wait until the indication disappears.
U 11	Cylinder clogs during the play mode.	Cleaning the cylinder.
H 01	After cylinder lock is detected, the cylinder does not start rotating again even after tape unloading.	Check the cylinder motor drive circuit.
H 02	Cassette tape is not wound up during tape unloading except Eject mode.	Check the capstan motor drive circuit.
F 03	Mechanism locks during mode transition except Eject mode.	1. Check the loading motor drive circuit. 2. Check the mechanism phase alignment. 3. Check the mode switch.
F 04	Mechanism locks during tape unloading.	1. Check the loading motor drive circuit. 2. Check the mechanism phase alignment.
F 05	Cassette tape is not wound up during tape unloading in Eject mode.	1. Check the capstan motor drive circuit. 2. Check the Supply/Take-up reel pulse.
F 06	Mechanism locks after tape unloading in Eject mode.	1. Check the loading motor drive circuit. 2. Check the mechanism phase alignment for cassette holder unit.
F 07	During recording mode recording signal is less than the normal condition.	Protection of the overcurrent flowing in transistor which produce the power supply for recording mode.
F 09	No communication of the main serial (between the system control and FIP driver control).	Check the system control microprocessor.

Fig. T1 Self-Test indication Display

7. SERVICE INFORMATION DISPLAY

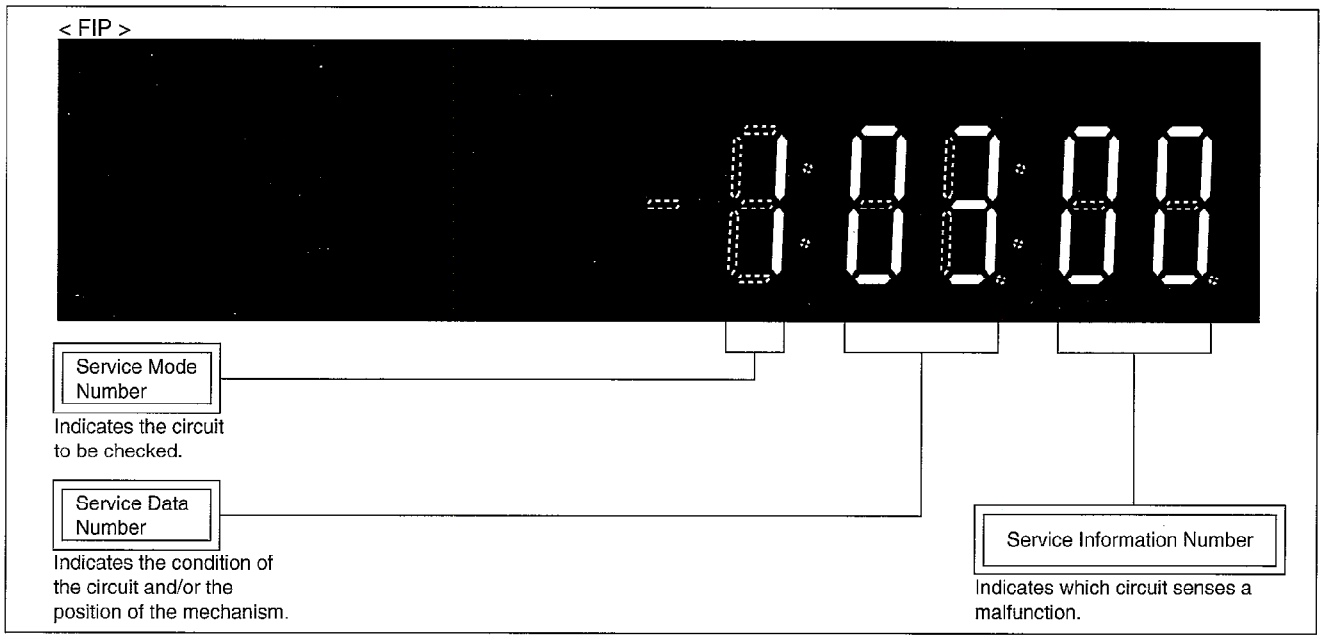

< FIP >
Service Mode Number
Indicates the circuit to be checked.
Service Data Number
Indicates the condition of the circuit and/or the position of the mechanism.
Service Information Number
Indicates which circuit senses a malfunction.

Fig. D1 Service Information Display

7-1 Purpose of Service Information Display

This information aids trouble shooting by indicating the source of the malfunction. The service mode number & service data number are used by the technician during repair while the service information can be used by consumer to diagnose malfunctions allowing the technician to provide a more accurate repair cost estimate and reduce repair time.

7-2. Turning on Service Information Display

Press FF, REW and EJECT buttons simultaneously.

In the Service Information Display, there are four digits divided into 3 functions.

The first digit indicates which of the 7 service modes that the unit is currently in.

MODE 1: Checks tape protection circuit.

MODE 2: Checks tape transport mechanism.

MODE 3: Checks mode switching operation.

MODE 4: Checks control buttons.

MODE 5: Checks capstan motor.

MODE 6: Checks cylinder motor.

MODE 7: Checks loading/unloading operation.

The second and third digits are service data which indicate the condition of the circuit or mechanism being checked.

The forth digit is the service infromation display. it is to be used by the consumer to help determine the source of a malfunction. The service information display operates independently of the service modes and stores the fault indication in memory for as long as AC power is not supplied.

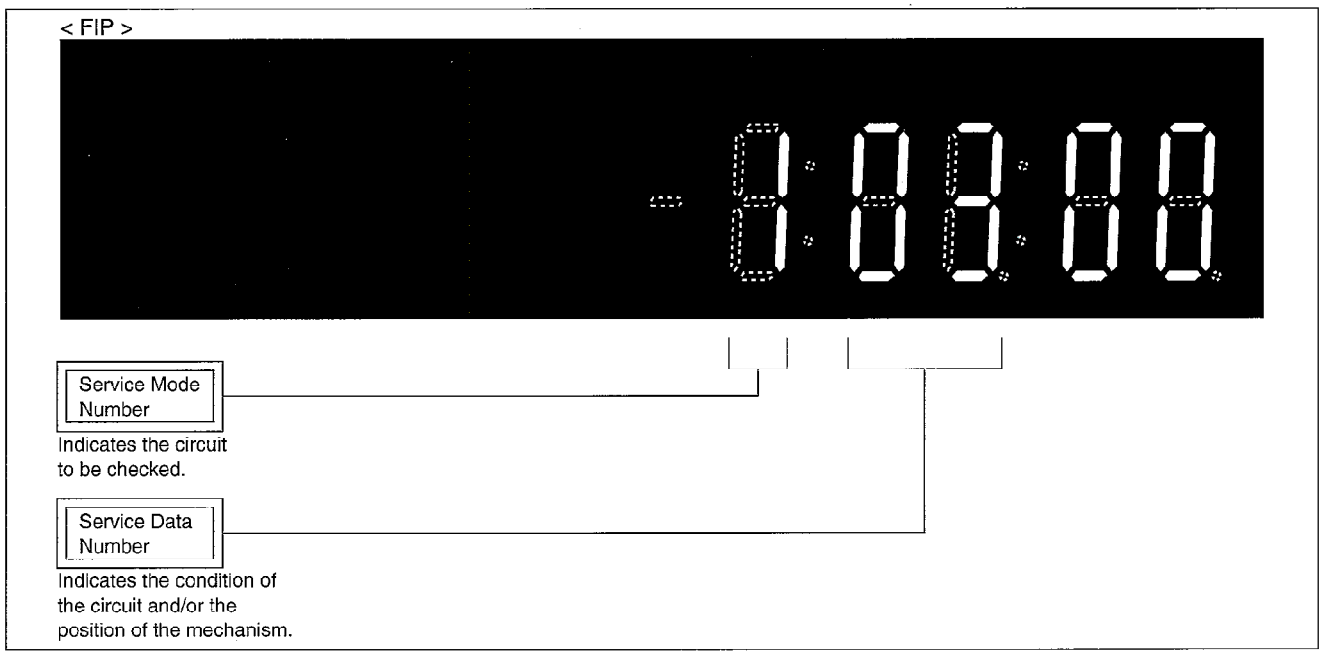

< FIP >
Service Mode Number
Indicates the circuit to be checked.
Service Data Number
Indicates the condition of the circuit and/or the position of the mechanism.

Fig. D2 Service Mode Number and Service Data Number on F.I.P.

7-3. Use of Service Modes

(1) Turn on Service information Display.

(2) To change Service Modes Press FF, REW and EJECT buttons simultaneously.

(3) Mode 0: Not used.

(4) Mode 1: Checks that the sensor LED, Supply & Take-up sensor circuits checks the circuits by blocking the light from the sensor LED to either or both Supply & Take-up Sensors. When the light is blocked to both sensors, "00" should be indicated on the service data number.
When the light is blocked to the supply sensor, "01" should be indicated.

(5) Mode 2: Checks the mode switch circuit while indicating mechanism position.
Service Data Numbers indicate the position of the mode switch and there by the mechanism position.

(6) Mode 3: Checks that mode switch circuit operations have been completed.
Service Data Number should indicate "00" after each mechanism operation is completed.

(7) Mode 4: Checks the operation circuit.
Indicates if SYSTEM CONTROL IC receives the operating commands from the mode buttons and/or remote controller.

(8) Mode 5: Checks the capstan motor circuit.
Indicates if the SYSTEM CONTROL IC has received the command to rotate the capstan motor.

(9) Mode 6: Checks the cylinder motor circuit.
SYSTEM CONTROL IC has received the command to rotate the cylinder motor.

(10) Mode 7: Checks the loading/unloading operation.
The loading motor rotates for loading operation when the "PLAY" button is pressed.
The loading motor rotates for unloading operation when the "STOP" button is pressed.
This mode can be displayed indefinitely until the OPERATE button is pressed.

<NOTE> Refer to Fig. D5 for details of Service Data Numbers.

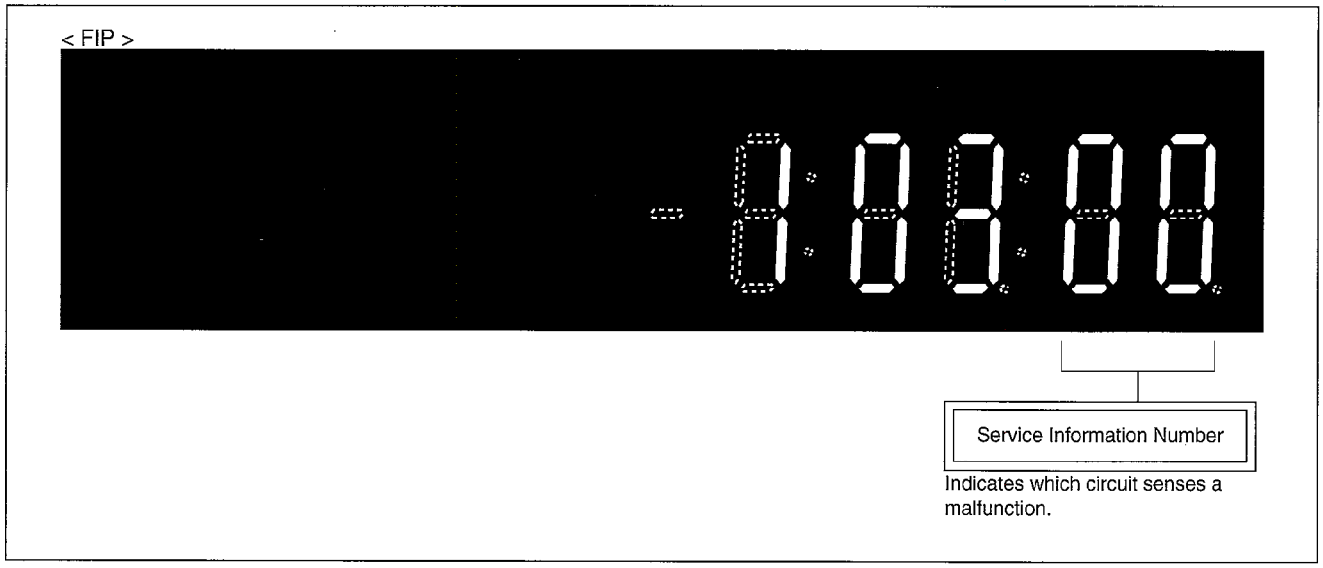


Fig. D3 Service Information Number on F.I.P.

7-4. Service Information Number

Refer to Fig. D4 for details of Service Infromation Number.

NOTE: The Service Information Number display is independent of the service mode display. The Service Information Number will be stored as long as AC power is not supplied (If can be displayed in the Service Mode 2.)

If a second error occurs, only the most recent error will be displayed.

Service Information Number	Malfunction
00	Normal condition (No problem)
01	Cylinder stop
02	Tape reel stop
03	Stop at position other than 04 or 06
04	Stop during unloading
05	Fault capstan rotation
06	Stop during Cassette-in/Eject operation
09	Fault of the main serial communication (Between system control and FIP driver)

Fig. D4 Detail Service Information Number

7-5. Test Mode

When the test terminals are shorted during turning off condition, the following operation will be performed after AC power is applied. Test Mode Information will be displayed on FIP insted of lincar counter.

(1) Power will be turned on automatically when AC power is applied.

(2) The direct operation of buttons are able to be performed.

(Examle) PLAY⟷REC, REC⟷EJECT

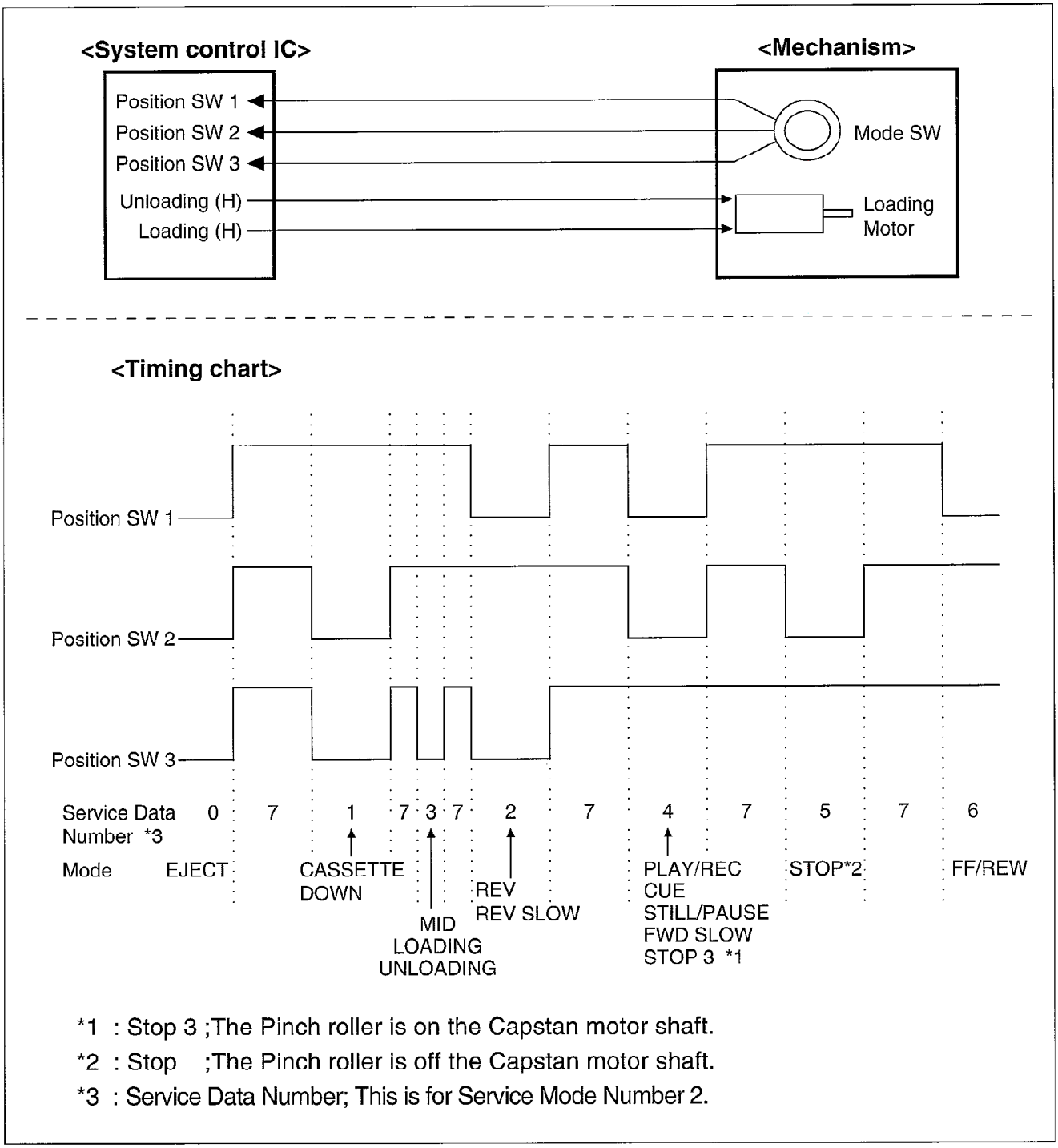
Service Mode Number	Note for checking Service Data Numbers	Service Data Numbers	Indication	Remarks
1	—	00	No light detected at either sensor	Tape not required.
		01	Tape beginning Light to Supply photo sensor is blocked.	
		02	Tape end Light to Take-up photo sensor is blocked.	
		03	Light detected at both sensors.	
2	—	00	EJECT	Tape required *1. STOP3: Pinch roller is on Capstan motor shaft. *2. STOP: Pirtch roller is off Capstan motor shaft.
		01	Cassette down	
		02	REV, REV SLOW	
		03	Loading/Unloading	
		04	PLAY, REC, STILL, PAUSE, CUE, FWD SLOW, STOP3*1	
		05	STOP*2	
		06	FF/REW	
		07	Intermediate position	
3	Disregard service data displayed until mechanism operation is completed. Then the display should indicate "00".	00	Any display other than "00" indicates a fault in the mode switch circuit or system.	Tape required.
4	Display only when the operating button is pressed.			Tape not required.
5	Left digit only, disregard Right digit display.	8 1 Left Right Digit Digit	8, 9, u, A, —, n, L and no display indicate that the Capstan motor "PLAY" command received by System control microprocessor.	Tape required. If a symbol other than those listed is displayed, a mulfunction in that circuit is indicated.
	Right digit only, disregard left digit disoaly.	8 7 Left Right Digit Digit	1, 2, 3, 4, 5, 6, 7 indicate that the Capstan motor "CUE, FF, FWD SLOW" commands received by system control microprocessor.	
	Right digit only, disregard left digit display.	8 — Left Right Digit Digit	8, 9, u, A, —, n, L and no display indicate that the Capstan motor "Reverse, REW, Reverse Slow" commands received by system control microprocessor.	
6	Left digit only, disregard Right digit display.	1 0 Left Right Digit Digit	1, 3, 5, 7, 9, A, n and no display indicate that the cylinder motor "ON" command received by system control microprocessor.	Tape required. If a symbol other than those listed is displayed, a mulfunction in that circuit is indicated.

Fig. D5 Service Data Display and Indication

7-6. Timing chart from Mode SW to System control IC

System control IC senses the mechanical position through the Mode SW.

Fig. D6 shows the timing for service mode number 2.



*1 : Stop 3 ;The Pinch roller is on the Capstan motor shaft.

*2 : Stop ;The Pinch roller is off the Capstan motor shaft.

*3 : Service Data Number; This is for Service Mode Number 2.

Fig. D6 Timing chart of Mode SW

8. SYSTEM CONTROL CIRCUIT & MECHANISM CONTROL CIRCUIT

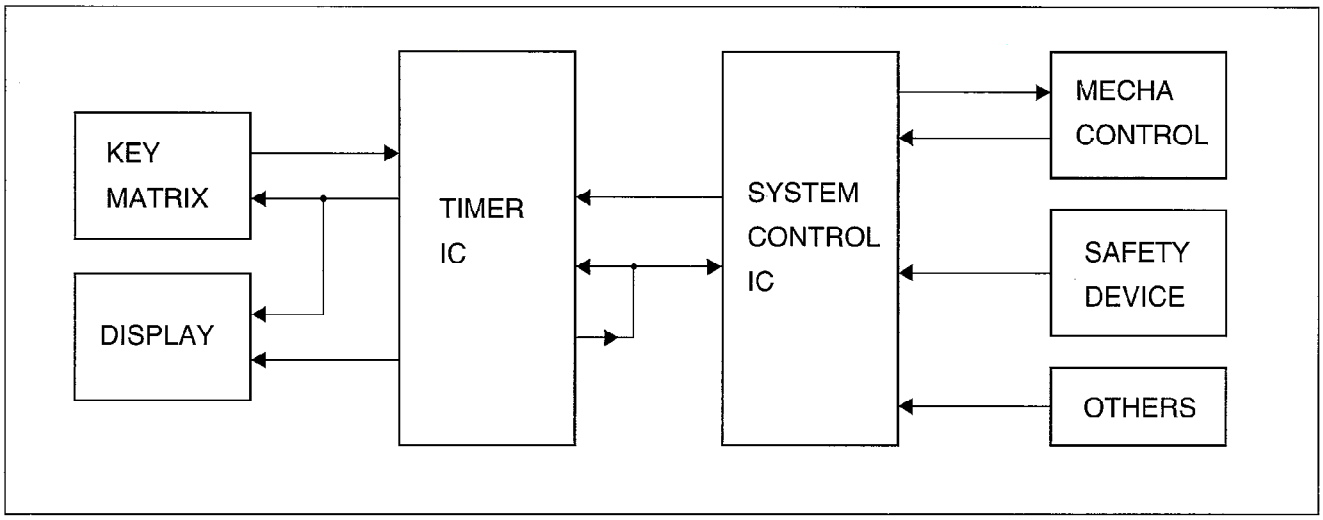


Fig. S1 Overall Block Diagram of System Control Circuit

8-1. STOP3 Specification

(1) The STOP3 is the playback stand-by mode.

(2) The unit is put into the STOP3 position after tape loading if the cassette tape does not have a clear leader tape.

(3) If the unit is in the STOP3 position when the power is switched off (included the Timer stand-by mode), the unit goes to the STOP position.

(4) If the cassette is in the unit when the power is turned on, the unit goes to the STOP3 position.

(5) When the cassette tape has clear leader tape, the unit is in loading mode after winding up the clear leader tape by Take-up reel at the cassette down position and the unit goes to STOP3 position.

8-2. Stand-by in the STOP3 position

(1) The unit goes to STOP3 position when the Stop mode is selected during the Play or Rec operations. The unit then loosens the tape tension by performing the Reverse Slow.
The Reverse Slow corresponds to the FG 40 pulses of the capstan (irrespective of SP/LP modes). The cylinder continues to rotate.

(2) After about 10 minutes in STOP3 mode, the unit shifts to the Stop position and the cylinder continues to rotate.

(3) After about 10 minutes in STOP mode, the unit stops the cylinder rotation.

8-3. Supply and Take-up Sensors

Supply and Take-up photo transistors are used to sense the beginning and end of a tape. The tape has transparent leaders at the beginning and end.

When these transparent leaders enter the tape transport path, they allow infrared light from the sensor LED to reach either one of the tape end sensors (photo-transistor).

If the Take-up end sensor detects the light, the microprocessor SYSTEM CONTROL IC places the VCR in the Stop mode and then performs a short Cue.

If the Supply end sensor is triggered, the microprocessor activates the Stop mode and the Rewind mode. The Rewind mode continues until the Take-up end sensor detects the end of the tape. The tape beginning is detects by a low signal at SYSTEM CONTROL IC Take-up photo terminal. The tape end is detected by a low signal at SYSTEM CONTROL IC Supply photo terminal.

If the light is received at both sensors at same time, the cassette is ejected.

<Operation after detecting the beginning and the end of tape>

Mode	Detection of the beginning	Detection of the end
Power on→off	Short CUE	Short REW
Cassette in	Short CUE	Short REW
Loading	Short CUE	Short REW
FF/CUE	——	Auto REW
REW/REV	Short CUE	——
PLAY, REC	——	Auto REW
SLOW	——	Auto REW
Timer REC	——	Power off

Both ends of tape detection (tape cut, no cassette),

(1) Cassette in: The cassette tape is ejected

(2) Other mode: The unit goes to Stop mode and it is impossible to operate except EJECT key.

(3) Timer REC: Power is turned off after short CUE is performed

8-4. Safety Tab Switch

A recorded video cassette can be protected against accidental erasure by breaking off the tab on the cassette. The cassette can now only be used for playback. To be able to record on the cassette, cover the hole with adhesive tape. If the safety tab on the cassette has been removed, Safety Tab Switch is off (open) and high signal is supplied to SYSTEM CONTROL IC Safety Tab terminal. The SYSTEM CONTROL IC will not go into the recording mode and automatically places the VCR in the playback mode.

8-5 Dew Sensor

If excessive moisture or condensation is present inside the machine (an internal humidity of more than 98%) the unit will stop if running. Until the moisture level decreases only the Eject mode will operate. To sense the humidity, a dew sensor is used. The sensor is a special variable resistor which change resistance with ambient humidity.

The sensor ranges in resistance from about 5K ohm at 90% humidity to about 50K omh at 98% humidity. Normally, the voltage across the sensor is low because of its low resistance.

But if moisture condenses inside the unit, the SYSTEM CONTROL IC voltage of Dew terminal increases to indicate a Dew condition.

Tape	Mode	Dew sensor ON	Dew sensor OFF
OUT	Power	Compulsory Power on	Power off
	Dew indication	Indicate "d" and "U10"	No indication
	Cylinder	Rotating *1	Stop
	Key operation	Not possible *2	Possible
	Cassette in	Immediately a cassette is ejected after it goes to cassette down position.	Possible
IN	Power	Compulsory Power on	Power off
	Dew indication	Indication "d" and "U10"	No indication
	Cylinder	Rotating *1	Stop
	Key operation	Not possible *2	Possible
	Cassette condition	A cassette goes to down position and is in stand-by mode.	Stand-by mode at STOP3 position.

*1: When the cylinder locks in dew mode, it will be released until dew sensor is truned off.

*2: The keys which do not relate to the tape running operation, are able to be used.

Dew sensor on: During Dew formation is detected and 80 minutes after completion of Dew detection.

Dew sensor off: 80 minutes later after copmletion of Dew detection.

8-6. Setting time for each mode

The time is set on each mode in order to protect tape and capstan driver. When the setting time is over, the mode is gone to the next mode.

Mode	Setting time	Switching mode
STILL, PAUSE	Approximately 5 minutes	STOP
CUE/REV lock	Approximately 10 minutes	PLAY
SLOW, F ADV	Approximately 10 minutes	STOP

8-7. Operation of short CUE

Short CUE stops when the Take-up photo sensor detects the black portion of the tape.

However its sensor does not detect the black portion within 4.0±1.0 sec., the mode except Power on/off and Eject modes will be abe to be operated after the unit stops. This is same as the timer over oeration of the reel lock.

8-8. Loading/Unloading Mechanism lock

Loading and unloading times are set, and in case the mechanism locks during loading or unloading operation within the defined time, the unit detects the mechanism lock and loading motor reverses or stops.

Loading operation lock: Cassette tape is unloaded and ejected within 5 seconds.

Unloading operation lock: Power is truned off within 5 seconds.

8-9. Cassette loading/unloading lock

(1) Mechanism locks during the cassette in operation.

① Cassette tape is ejected approximately 2 seconds later when the mechanism locks during the cassette in operation.

② In case mechanism locks during eject operation, cassette tape is inserted and power is turned off approximately 2 seconds later.

③ When Mechanism locks during cassette in operation, power is turned off approximately 2 seconds.

In case the mechanism lock is released on thc way and cassette is ejected, the unit continues the normal operation.

(2) Mechanism locks during the eject operation.

① Cassette tape goes to cassette down position approximately 2 seconds later and power is turned off when mechanism locks during eject operation.

② Mechanism locks during cassette down operation, power is turned off.

8-10. Reel lock operation

When the Suuply or Take-up reel mechanism locks during the tape running, the following operation is performed.

FF/REW : Unloading and loading. The unit goes to CUE/REV mode.

PLAY/CUE/REC : Unloading till the cassette down position and loading. The unit goes to STOP3 position.

RVS PLAY/REV : Unloading till the cassette down position and loading. The unit goes to STOP3 position.

The reel pulse cycle is started to count after the mechanism mode is fixed.

In case the counted pulse cycle exceeds the defined value, the unit goes to STOP mode due to judge that lock of reel mechanism is detected.

<The value of reel lock detection time>

NTSC/SP mode

Mode	Speed (Ratio)	Time (S)
PLAY	±1	3.5
CUE/REV	±5	1.6

PAL/SP mode

Mode	Speed (Ratio)	Time (S)
PLAY	±1	3.5
CUE/REV	±5	1.6

The reel lock time in FF/REW mode is 800msec.

When the tape speed is less than 0.23m/s, reel lock is judged.

8-11. Cylinder lock

<Start rotation>

When the cylinder neither start rotating nor go to the stability rotation within 5 seconds, it is unloading under keeping the mode. In case the cylinder starts operating and stability rotation, the mechanism goes to STOP3 position.

If it is not possible, Power is turned off and cylinder trouble "H01" is displayed.

<During rotation>

The head switching pulse is supplied to the cylinder when the cylinder starts the stable revolution. In case the head switching pulse comes to the cylinder within 0.5 seconds, the cylinder lock is judged and the following operation is activated.

Timer REC: Power off

PLAY, REC: STOP

8-12. Mode transition

The relation between the present mode and operation key is shown in the following table.

PRESET MODE	OPERATION KEY							
	P SW	EJECT	STOP	REW	FF	PLAY	PAUSE	REC
P-OFF	P-ON	EJECT	——	——	——	PLAY	——	——
EJECT	P-OFF	——	——	——	——	——	——	——
STOP	P-OFF	EJECT	——	REW	FF	PLAY	——	REC
REW	P-OFF	EJECT	STOP	REV	FF	PLAY	——	——
FF	P-OFF	EJECT	STOP	REW	CUE	PLAY	——	——
REV	P-OFF	EJECT	STOP	——	CUE	PLAY	STILL	——
CUE	P-OFF	EJECT	STOP	REV	——	PLAY	STILL	——
PLAY	P-OFF	EJECT	STOP	REV	CUE	——	STILL	——
STILL	P-OFF	EJECT	STOP	REV	CUE	PLAY	PLAY	REC PS
REC	P-OFF	——	STOP	——	——	——	REC PS	*1
REC/PS	P-OFF	——	STOP	——	——	——	REC	——

*1: VISS WRITE

Pressing two keys simultaneously, the key operation is going to be ineffective.

In case the unit goes to CUE/REV lock mode by pressing FF/REW key lightly during Play mode, CUE/REV mode will be returned previous mode when FF/REW key is pressed more than 0.7 seconds.

8-13. Power on reset

When the power is turned on, the unit is going to reset and the following datas are cleared.

(1) Position switch data

(2) Operation mode data

(3) Prohibition flags

In case the mechanism is in cassette down position, tape slag is removed as the initial operation and the unit goes to STOP3 position.

8-14. Linear time counter operation

The counter value will be gone up/down by counting control pulse. As for NTSC system during Play/Rec mode, counter value goes up/down every 30 pulses. As for PAL system during Play/Rec mode, counter value goes up/down every 25 pulses.

8-15. Tape speed in CUE/REV mode

	NTSC	PAL
Standard	9 times	11 times

8-16. Automatic functions

(1) Automatic Power on

① Under power off, when a cassette tape is inserted, power is turned on automatically and cassette tape is loaded.

② Under power off and a cassette tape has been inserted, when PLAY key is pressed, power is turned on automatically and goes to PLAY mode.

(2) Automatic play

When a cassette tape removed safety tab is loaded, the mode goes into Play mode.

(3) Automatic rewind

When tape running is reached to the end of tape, automatically goes to Rew mode and stops when tape running will be reached to the beginning of tape.

In case of Timer recording, short Rew is performed for 2 seconds and power is turned off when tape running is reached to the end of tape.

(4) Power off and Eject

Under power off and a cassette tape has been inserted, when Eject key is pressed, a cassette tape is ejected and power is turned off

8-17. CUE/REV lock mode

When FF/REW key is pressed lightly (less than 0.7 seconds) during Play mode, unit goes into CUE/REV mode. To release CUE/REV mode, FF/REW key should be pressed more than 0.7 seconds.

8-18. FR (Forward/Reverse) search mode

When FF/REW key is pressed during FF/REW mode, unit goes into CUE/REV mode.

To release CUE/REV mode, FF/REW key have to be pressed.

8-19 FF/REW speed

Maximum tape speed is approximately 3.0 m/s during the stable running.

8-20 FF/REW time

The tape running from the beginning to the end of T-120 type (E-180 type) cassette tape is able to be completed within 150 seconds.

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